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Updated set of draft guidelines for the long-term sustainability of outer space activities

Note by the Secretariat

I. Introduction

1. At the fifty-second session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, the Working Group on the Long-term Sustainability of Outer Space Activities noted that an updated version of the set of draft guidelines for the long-term sustainability of outer space activities would be prepared in the six official languages of the United Nations prior to the fifty-eighth session of the Committee, in 2015. Section II of the present document contains an updated set of draft guidelines, in the preparation of which inputs received up until the end of the fifty-second session of the Scientific and Technical Subcommittee were taken into consideration. They comprise the amended consolidated draft guidelines contained in document A/AC.105/C.1/L.340 and the 10 new draft guidelines proposed during that session. Section III contains a proposal for the regrouping of the draft guidelines into four categories. The proposal was introduced during the fifty-second session of the Scientific and Technical Subcommittee and reflects only the draft guidelines contained in document A/AC.105/C.1/L.340.

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II. Draft guidelines for the long-term sustainability of outer space activities

A. Context of the guidelines for the long-term sustainability of outer space activities

1. Background

2. In The Space Millennium: Vienna Declaration on Space and Human Development,[1] the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) recognized the importance of space science and space applications for improving our fundamental knowledge of the universe and the daily lives of people worldwide through environmental monitoring, management of natural resources, early warning systems to help mitigate disasters and support disaster management, meteorological forecasting, climate modelling, satellite navigation and communications. Space science and technology make a major contribution to the well-being of humanity and, specifically, to achieving the objectives of global conferences of the United Nations that address various aspects of economic, social and cultural development. Space activities therefore play a vital role in supporting sustainable development on Earth. They have contributed to progress towards the achievement of the Millennium Development Goals and will contribute to the realization of the post-2015 development agenda. Hence, the long-term sustainability of space activities is a matter of interest and importance not only for current and aspiring participants in space activities, but also for the international community as a whole.

3. The space environment is being used by more and more States, international intergovernmental organizations and non-governmental entities. The proliferation of space debris and the increased possibilities of collisions and interference with the operation of space objects raise concerns about the long-term sustainability of space activities, particularly in the low-Earth orbit and geostationary orbit environments.

4. States, international intergovernmental organizations and national and international non-governmental entities that are involved in space activities should take steps to ensure that their activities do not diminish the ability of others to carry out their own space activities, either now or in the future.

5. Over the years, the Committee on the Peaceful Uses of Outer Space has considered different aspects of the long-term sustainability of outer space activities from various perspectives. Building on those previous efforts and relevant related efforts by other entities, the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee has proposed a series of measures with a view to providing a holistic approach to promoting the long-term sustainability of outer space activities.

6. The proposed measures, compiled in a set of voluntary guidelines, provide a foundation for the development of national and international practices and safety frameworks for conducting outer space activities, while allowing for flexibility in

[1] *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999* (United Nations publication, Sales No. E.00.I.3), chap. I, resolution 1.

adapting such frameworks to specific national circumstances and organizational structures. The guidelines address the policy, regulatory, organizational, scientific, technical, international cooperation and capacity-building aspects of space activities.

7. The legal framework in which the set of guidelines contained in the present document was developed consists of the existing United Nations treaties and principles on outer space. In addition, current practices, operating procedures, technical standards, policies and experiences gained through the conduct of space activities have also been taken into consideration in the compilation of this set of guidelines.

8. The guidelines contained in the present document reflect an international consensus on measures needed to enhance the long-term sustainability of outer space activities, based on current knowledge and established practices. As a deeper understanding of the various factors influencing the long-term sustainability of space activities develops, the guidelines should be reviewed, and could be revised in the light of new findings.

9. The implementation of national and international frameworks for the conduct of space activities not only provides assurance to users of the space environment but also facilitates bilateral and multilateral cooperation in the peaceful uses of outer space and thereby contributes to the safety and stability of outer space.

2. Scope and application

10. The long-term sustainability of outer space activities entails the need to reconcile the objectives of access to the exploration and use of outer space by all States and governmental and non-governmental entities only for peaceful purposes with the need to preserve and protect the outer space environment in a manner that takes into account the needs of future generations.

11. The guidelines contained in the present document are applicable to all space activities, whether planned or ongoing, and all phases of a mission life cycle, including launch, operation and end-of-life disposal. The guidelines relate to the policy, regulatory and organizational aspects, the scientific and technical aspects, and international cooperation and capacity-building aspects of the safe and sustainable conduct of outer space activities, and are based on a substantial body of knowledge and the experiences of States, international intergovernmental organizations, and national and international non-governmental entities. Therefore, the guidelines are relevant to both governmental and non-governmental entities.

12. The guidelines are voluntary and not legally binding under international law. They are intended to supplement guidance available in existing standards and regulatory requirements.

13. The implementation of the guidelines is considered a prudent and necessary step towards preserving the outer space environment for future generations. States, international intergovernmental organizations and national and international non-governmental entities should voluntarily take measures, through their own applicable mechanisms, to ensure that the guidelines are implemented to the greatest extent feasible and practicable.

B. Guidelines for the long-term sustainability of outer space activities

14. The following set of voluntary guidelines establishing the concept of, and defining basic criteria and domestic and international practices for ensuring, the long-term sustainability of outer space activities is premised on the understanding that outer space is to continuously remain an operationally stable, safe and conflict-free environment open for peaceful uses and international cooperation, as intrinsically interrelated with the international community making full use of opportunities to steadily increase, through dedicated practical measures, the predictability and transparency of, and the building of confidence in, space activities, as those features are conducive to and instrumental in the application of the guidelines for the long-term sustainability of outer space activities.

15. In applying the guidelines in good faith, States and international intergovernmental organizations shall provide for the establishment and effectuation of an appropriate system for internal regulation (including the necessary procedures and requirements) and international cooperation mechanisms in order to execute relevant functions with the aim of performing tasks related to ensuring the long-term sustainability of outer space activities.

16. The guidelines, as applied by States and international intergovernmental organizations through the use of appropriate means that would neither neglect nor challenge in any formal or practical way the existing principles and norms of international law, are designed to provide an effective regulatory framework for addressing practical ways and means of achieving the more rational organization of activities in outer space so that States and international intergovernmental organizations are in a position to conduct such activities by making use of existing mechanisms, and putting in place new mechanisms, that would reliably accommodate needs for the development, through cooperative endeavours, of space potential and assist in reducing to a minimum or, as feasible, avoiding serious harm to the outer space environment and the safety of space operations.

17. In achieving the goal of ensuring the long-term sustainability of outer space activities, States and international intergovernmental organizations should refrain from any acts and practices, as well as from the use of means or methods, that could, purposefully or inadvertently, affect in any way, in violation of the principles and norms of international law, and/or harm, in the same manner, assets in outer space and/or lead to the evolvement of circumstances which could render full and effective application of the guidelines impracticable on national security grounds.

18. Without prejudice to any of the constituent elements of the concept of and practices for ensuring the long-term sustainability of outer space activities, risk monitoring for the purpose of identifying factors influencing the nature and magnitude of risks in the various segments of outer space activity and potential hazardous situations and developments in the space environment should be perceived as the most challenging task in terms of providing the context for creating incentives with regard to putting into effect and observing operational procedures whereby States and international intergovernmental organizations could, considering applicable legislative and conventional regulations, effectively cooperate, advising and assisting each other in all practical ways possible.

19. The guidelines are groupe into three categories to facilitate their implementation by various gove mental and non-governmental space actors: policy, regulatory and organizational; scientific and technical; international cooperation and capacity-building.

1. Policy, regulatory and organizational guidelines

20. Guidelines [...] to [...] provide guidance on the development of policies, regulatory frameworks and practices that support the long-term sustainability of outer space activities for Governments and relevant international intergovernmental organizations authorizing or conducting space activities. They also reaffirm the importance of preventing the placement of weapons in the outer space environment and implementing transparency and confidence-building measures in outer space activities in order to prevent the occurrence of any incidents that may affect that environment. The guidance addresses the adoption of national regulatory frameworks and the promotion of recommended voluntary measures by entities conducting outer space activities to promote the safety and sustainability of such activities. This guidance also includes measures to facilitate sharing of information on space objects and orbital events and sharing of contact information for entities responsible for spacecraft operations.

Establishment of normative and organizational frameworks for ensuring effective and sustained implementation of the guidelines and subsequent activity on their review and enhancement (guideline 46)

States and international intergovernmental organizations should, acting in a dedicated fashion, establish a regulatory framework that would pragmatically and effectively lead to, and sustain, positive experience in upholding the virtues that reside in the guidelines and, specifically, put in place relevant regulations, processes and compliance review arrangements. It should be commonly understood that the guidelines, while being subject to voluntary implementation from a formally legal perspective, are to be perceived in direct relation to, and as a functional augmentation of, the principles and norms of international law, and that their operation should be supported by appropriate political reasoning and institutional backing in core doctrinal texts. The guidelines should, through a manifest process, be officially attributed the status of a standard-setting document establishing internationally recognized baseline and advanced conditions for ensuring the safety of space operations and, in general, the long-term sustainability of outer space activities. Proceeding from such an understanding, States and international intergovernmental organizations should establish a means to effectively administer existing and, if necessary, leverage new security procedures, to meet operational requirements uniquely associated with the guidelines. In the course of implementing new approaches in safety/security affairs as they relate to outer space activities, States are encouraged to secure such a state of affairs whereby they would take account of national security considerations, in the context of pertinent national policy priorities, objectives and measures, proportionally to the purposes and tasks of applying the guidelines and in appropriate correlation with the substance, nature, requirements and particularities of international cooperation provided for by the guidelines. Decision-making tasks and concepts should be designed so that the understanding outlined above is diligently upheld. Likewise, international intergovernmental organizations should associate their own policies with this

understanding and, acting through conventional regulations and engagement with member States, endeavour to ensure that the aggregate concept underlying their actions duly correlates with the above understanding.

The United Nations should be regarded by States and international intergovernmental organizations as the principal venue for continued institutionalized dialogue on issues related to facilitating practical success in the efficient and comprehensive implementation of the guidelines on ensuring the long-term sustainability of outer space activities, and the United Nations itself should, acting in this capacity through the Committee on the Peaceful Uses of Outer Space and the Office for Outer Space Affairs of the Secretariat, sustain a dedicated policy process and provide for an adaptable decision-making platform in this domain. The Committee should, as necessary, develop sets of solutions, in particular, in the format of agreed understandings (either regulatory or interpretative) that could, following applicable procedures, be formally attached to the guidelines. States and international intergovernmental organizations are strongly encouraged to introduce and support the practice of providing the Office with annual reports, time-framed for the sessions of the Committee, containing assessments of the status of implementation of guidelines. In such reports, States and international intergovernmental organizations should corroborate, with the support of credible estimates and indicators, their perception that current (as of the date of the reports) outer space activities (in general and/or in specific aspects) are stable, safe and conflict-free in all major aspects, thus affirming positive motivations with regard to the implementation of the guidelines. If warranted, such reports should also identify phenomena in outer space and/or developments in outer space activities that appear to be manifestly at variance with the guidelines and, hence, would possibly necessitate special consideration by the Committee at its immediate session. In addition, exigency notifications may be filed with the Office referencing occurrences (their plausible attributes and origin) causing particular concerns in the context of implementation of the guidelines pertaining to the safety of space operations and containing an appeal to the Office to mediate in requesting clarification of those occurrences from those States and/or international intergovernmental organizations which may have a relation to such occurrences. As part of projecting an open posture towards information exchanges benefiting effective implementation of the guidelines, specifically, as they relate to safety of space operations, States and international intergovernmental organizations should not neglect reporting to the Office on events that result from their own actions (or omissions to act) or actions (or failure to act) on the part of non-governmental entities under their jurisdiction and control and may be deemed essentially important in practical terms.

Supervising national space activities (guidelines 14 + 32 + 33)

In supervising space activities of non-governmental entities, States should ensure that entities under their jurisdiction and/or control that conduct outer space activities have the appropriate structures and procedures for planning and conducting space activities in a manner that supports the objective of enhancing the long-term sustainability of outer space activities, and that they have the means to comply with relevant national and international regulatory frameworks, requirements, policies and processes in this regard. States should

ensure that appropriate communication and consultation mechanisms are in place within and among the competent bodies that oversee or conduct space activities.

States bear international responsibility for national activities in outer space and for the authorization and continuing supervision of such activities, which are to be carried out in conformity with international law. States should not invoke national interests or national legislation to carry out operations that may run contrary to these guidelines or any of the principles enshrined in United Nations treaties, guidelines and other documents relating to outer space activities. In fulfilling this responsibility, States should encourage the entities conducting space activities, which play a role in ensuring that a given space activity does not jeopardize the long-term sustainability of outer space activities, to do the following:

(a) Establish and maintain all the necessary technical competencies required to conduct outer space activities in a safe and responsible manner and to enable it to comply with the relevant governmental and intergovernmental regulatory frameworks, requirements, policies and processes;

(b) Develop specific requirements and procedures to address the safety and reliability of outer space activities under the entity's control, during all phases of a mission life cycle;

(c) Assess all risks to the long-term sustainability of outer space activities associated with the space activities conducted by the entity, in all phases of the mission life cycle, and take steps to mitigate such risks.

In addition, space agencies or entities under their jurisdiction are encouraged to establish a responsible entity to plan, coordinate and assess space activities to ensure their effectiveness in supporting sustainable development goals and processes and in supporting the objectives of the guidelines for the long-term sustainability of outer space activities in a broader perspective and vision.

The management of an entity that conducts outer space activities should ensure that the entity's structures and procedures for planning and conducting space activities support the objective of promoting the long-term sustainability of outer space activities. Appropriate measures to be taken by management in this regard should include:

(a) A commitment at the highest levels of the entity to promoting the long-term sustainability of outer space activities;

(b) Establishing and fostering an organizational commitment to promoting the long-term sustainability of outer space activities within the entity, as well as in relevant interactions with other entities;

(c) Ensuring that the entity's commitment to the long-term sustainability of outer space activities is reflected in its management structure and procedures for planning, developing and conducting outer space activities;

(d) Encouraging, as appropriate, the sharing of the experiences of the entity in the conduct of safe and sustainable outer space activities as a contribution by the entity to enhancing the long-term sustainability of outer space activities;

(e) Designating a contact point within the entity responsible for communication with relevant authorities to facilitate efficient and timely sharing of information and coordination of potentially urgent measures to promote the safety and sustainability of outer space activities.

States should ensure that appropriate communication and consultation mechanisms are in place within and among the competent bodies that oversee or conduct space activities. Communication within and among relevant regulatory bodies can promote regulations that are consistent, predictable and transparent so as to ensure that regulatory outcomes are as intended.

Registration information on space objects (guideline 6)

States and international intergovernmental organizations should, in fulfilling their obligations under the Registration Convention, make additional efforts to provide registration information as soon as practicable in order to assist in the identification of space objects.

States and international intergovernmental organizations should provide registration information on space objects in accordance with the Convention on Registration of Objects Launched into Outer Space of 14 January 1975. States and international intergovernmental organizations should provide such registration information to the Secretary-General of the United Nations as soon as practicable to assist in the identification of space objects and of the State of registry that retains jurisdiction and control over those space objects. States and international intergovernmental organizations should consider furnishing enhanced registration information, as recommended by the General Assembly in its resolution 62/101.

Consistent enhancement of the practice in registering space objects (guideline 40)

States and international intergovernmental organizations, acting in support of the objectives of the Convention on Registration of Objects Launched into Outer Space of 14 January 1975, should, on a continuous basis, take measures to ensure effective and comprehensive implementation of the registration procedure established by the said Convention. In this context, they should also undertake to translate into successful political action, through practical tools and normative regulation, the accomplishment of the tasks of enhancing the practice in registering space objects, as set by the relevant resolutions and recommendations of the United Nations General Assembly, so that the procedures for provision of expanded registration information gain wide international acceptance and are sustained in the long term. States and international intergovernmental organizations should act in this domain in a responsible way, considering proper registration of space objects an important factor of security in outer space, and should accordingly be guided by, and make their policies contingent upon, the following overriding principles and understandings.

It should be conclusively assumed and/or provided for under regulatory instruments enforced by States and international intergovernmental organizations and related to space policies that States and international intergovernmental organizations should not, in any formal or practical way, neglect or unduly perform the procedure of registration, and that non-registration of space objects may have serious negative implications for ensuring the safety of space operations. States and international intergovernmental organizations should discourage non-registration and should not

provoke, support or allow any non-registration practices for whatever reason. Solutions should also be sought whenever specific launches of space objects give rise to legal or technical issues that call for diligence in the implementation of registration procedures.

In the case that it can be plausibly maintained that a space object has not been registered in accordance with the criteria provided for in the Registration Convention and resolutions of the General Assembly, States and international intergovernmental organizations may direct a request to the State/international intergovernmental organization that presumably abstained from registration to clarify its intentions or officially refute the fact of non-registration. Any assumption of non-registration should be substantiated accordingly. Such requests should be responded to, and the presumed fact of non-registration should be commented on, with a view to clearing up any possible misconceptions and/or resolving concerns. In making appropriate responses the requested States/international intergovernmental organizations should, when appropriate, provide for the assurance of the absence of ulterior motives and/or specific intent behind a non-registration that actually took place. States and international intergovernmental organizations are obliged to act in such a way as to avoid abuse of the right to direct such requests.

The Office for Outer Space Affairs should, on a continuous basis, be vested with appropriate authority to take action to establish and sustain an implementation mechanism that would enable it to satisfactorily achieve the goal of encouraging and ensuring the adherence of States and international intergovernmental organizations to consolidated practice in furnishing expanded registration information. Specifically, the Office should be effectively engaged in executing integrated functions pertaining to: the accumulation of information on orbital launches performed (i.e., actually completed launches resulting in the placement of objects into Earth orbit or beyond) and orbital objects (i.e., space objects which have actually been launched into Earth orbit or beyond); and the assignment of international designations to orbital launches and orbital objects in accordance with Committee on Space Research notation, as well as the provision of such designations to the States of registry.

The launching States and, where appropriate, international intergovernmental organizations should assume the responsibility for requesting, on legitimate grounds, space launch service providers and users to meet all registration requirements under the Registration Convention, and for encouraging their receptiveness to the feasibility of, and urging them to contemplate, the provision of expanded registration information. States and international intergovernmental organizations, having institutionalized the practice of providing expanded registration information, should strive to sustain such practice. In cases where such practice ceases to correspond to the interests of a State, in particular within the purview of its national security policies, or the interests of an international intergovernmental organization, in particular pertaining to security, such State or international intergovernmental organization should, in an official statement forwarded to the Office for Outer Space Affairs, identify circumstances that make such continued practice impossible.

States and international intergovernmental organizations, acting in a responsible way in the interests of ensuring the safety of space operations, should to the

maximum extent possible provide information describing the condition (status) of a space object and changes in orbital location of a space object. Description of the condition (status) of a space object should be provided as correlated with the following indicative list of circumstances of its flight, which is to be considered immediately responsive to the task of ensuring the safety of space operations and functionally equivalent to the occurrences presumed in paragraph 2 (b) (ii) of General Assembly resolution 62/101:

(a) Termination or renewal of functioning of a space object;

(b) Loss of functionality of a space object due to technical flaws or other reasons;

(c) Loss of ability to control the flight of a space object with simultaneous emergence of the risk of harmful radio frequency interference with radio links of other functioning space objects and/or the risk of potentially hazardous conjunctions with other functioning space objects;

(d) Separation (if envisaged) of subsatellites and/or technological elements of space objects;

(e) Deployment (if envisaged) of the construction elements which purposefully change properties of a space object that influence its orbital lifetime.

States and international intergovernmental organizations, acting in the same manner, should to the maximum extent possible provide the information which is presumed in paragraph 4 (a) (iii) of General Assembly resolution 62/101 and which describes changes in the orbital location of the space object, in accordance with the following indicative list:

(a) Purposeful change of orbital parameters of a space object as a result of which the said space object moves to a different region of near-Earth space;

(b) Placement of a space object into a graveyard orbit or an orbit with reduced ballistic lifetime;

(c) Change in location on geostationary orbit;

(d) Repositioning (not entailing significant changes in basic orbital parameters) of a spacecraft operating as part of a satellite constellation among nominal slots within the orbital structure of this constellation.

In cases where a launched space object contains other space objects planned for future separation and independent orbital flight, States and international intergovernmental organizations should, in the course of registering the main space object (at the stage of entry in their registry and when furnishing registration information to the Secretary-General of the United Nations), indicate (for example, in the form of side notes) the number and names of space objects planned for separation from the main one, with the understanding that those space objects should not be given different or modified names at the stage of subsequent registration.

Contact information and information on space objects and orbital events (guideline 20)

States and international intergovernmental organizations should provide regularly updated contact information for entities authorized to engage in

appropriate information exchanges and/or responsible for spacecraft operations and conjunction assessment and to develop [a mechanism] [procedures] for the exchange of appropriate information relating to actual or potential situations in near-Earth space.

States and international intergovernmental organizations should exchange regularly updated contact information on appropriate entities responsible for spacecraft operations and conjunction assessment and to establish appropriate [a mechanism] [procedures] to enable timely coordination to reduce the probability of, and facilitate effective responses to, orbital collisions, orbital break-ups and other events that might increase the probability of accidental collisions.

In order to enable information exchange in contingency situations, States and international intergovernmental organizations should designate, and make publicly available contact information for, entities with the authority and capability to engage in information exchanges, process incoming incident reports and forecasts and serve as contact points with regard to adopting precautionary and response measures, thus supporting crisis warning and management mechanisms.

[*Alternative 1 for third paragraph*]

[States and international intergovernmental organizations should develop, implement and use an international mechanism, open for broad participation, for exchanging data on all functioning and non-functioning objects in near-Earth space.]

[*Alternative 2 for third paragraph*]

[States and international intergovernmental organizations should develop and implement appropriate procedures for exchanging information related to actual or potential situations in near-Earth space that may affect the safety and security of outer space operations.]

[This mechanism] [These procedures] can be used to exchange relevant information on space objects, as mutually agreed. The providing entity is encouraged to ensure that such information exchanged is accurate, to the extent practicable, and its time reference and period of applicability should be noted. [This mechanism] [These procedures] should allow information to be exchanged in a timely manner to enable precautionary actions.

To implement this guideline, States and international intergovernmental organizations are encouraged to discuss procedures to exchange relevant information on space objects, including the possible establishment of a unified centre for information on near-Earth space monitoring, to be established and operated under the auspices of the United Nations to serve as a core element of a distributed international information system and an information platform for multilateral cooperation in sharing and disseminating multi-source information on objects and events in near-Earth space. The organizational arrangement and statutory tasks and responsibilities of the centre shall be elaborated through the Committee on the Peaceful Uses of Outer Space and endorsed by the General Assembly.

Spectrum protection and equitable use of orbits (guideline 4)

States and international intergovernmental organizations should, in fulfilling their obligations under the Constitution, Convention and the Radio Regulations of the International Telecommunication Union as Member States or Sector Members, respectively, pay particular attention to the long-term sustainability of space activities and sustainable development on Earth and to facilitating the prompt resolution of identified harmful radio frequency interference. Therefore it is imperative that not only the International Telecommunication Union Radio Regulations and Recommendations should be protected but also appropriate safeguards should be provided to ensure equitable access to geostationary orbit to all nations for sustainable development on Earth.

The radio frequency spectrum is a limited natural resource that should be used rationally, efficiently, sustainably and economically so that countries or groups of countries may have equitable access to radio frequencies for the conduct of their space activities, taking into account the special needs of developing countries and the geographical situation of particular countries. States and international intergovernmental organizations should ensure that their space activities are conducted so as to fulfil obligations under the International Telecommunication Union (ITU) Radio Regulations, in order to avoid harmful interference with reception and transmission of radio signals related to the space activities of other States and international intergovernmental organizations, and as one of the means of promoting the long-term sustainability of outer space activities.

In their use of the electromagnetic spectrum, States and international intergovernmental organizations should consider the requirements for space-based Earth observation systems and other space-based systems and services in support of sustainable development on Earth, in accordance with the Radio Regulations and recommendations of the International Telecommunication Union.

States and international intergovernmental organizations should facilitate the implementation of the radio regulation procedures established by ITU for space radio links. Moreover, States and international intergovernmental organizations should encourage and support regional and international cooperation aimed at improving efficiency in decision-making and implementation of practical measures to eliminate identified harmful radio frequency interference in space radio links.

States and international intergovernmental organizations reiterate their full respect to the principle of freedom of access to outer space in fair conditions in favour of all States without any discrimination. Moreover, States and international intergovernmental organizations should promote equitable and rational use of the various orbital regions where artificial satellites are found.

Adoption, revision and amendment of national regulatory frameworks (guidelines 9 + 12)

States should adopt, revise or amend national regulatory frameworks, taking into account their obligations under the United Nations treaties on outer space as States responsible for national activities in outer space and as launching States. When adopting, revising, amending or implementing national regulatory frameworks, States should consider the long-term sustainability of outer space activities.

With the globalization and generalization of space activities, in particular the emergence of non-governmental entities providing services and carrying out operations, States should adopt, revise or amend regulatory frameworks to ensure the effective application of international norms, considering the specificities of non-governmental entities, for which States bear international responsibility. States should consider the application of relevant, generally accepted standards and practices for the safe conduct of outer space activities.

When developing, revising, amending or adopting national regulatory frameworks, States should consider the provisions of General Assembly resolution 68/74 on recommendations on national legislation relevant to the peaceful exploration and use of outer space. In particular, States should consider not only existing space projects and activities but also the potential development of their national space sector, and envisage appropriate timely regulation in order to avoid legal lacunae. It is important for national regulations to address the specific nature and characteristics of the State's space sector, as well as its general economic framework, which provides the context in which the space sector may further expand.

States, in enacting new regulations, or in revising or amending existing legislation, should bear in mind their obligations under article VI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Traditionally, national regulations have been concerned with issues such as safety, liability, reliability and cost. As new regulations are developed, States should consider regulations that enhance the long-term sustainability of outer space activities. At the same time, regulations should not be so prescriptive as to prevent initiatives addressing the long-term sustainability of outer space activities.

Elements to be taken into consideration when developing, revising or amending national regulatory frameworks (guidelines 10 + 11 + 13 + 22 + 23)

In developing, revising or amending regulatory measures applicable to the long-term sustainability of outer space activities, States should:

(a) Implement international obligations, including those arising under the United Nations space treaties to which they are party;

(b) Implement space debris mitigation measures;

(c) Address risks to people, property, public health and the environment associated with the launch, in-orbit operation and re-entry of space objects;

(d) Consider the potential benefits of using existing international technical standards;

(e) Weigh the costs, benefits, disadvantages and risks of a range of alternatives;

(f) Encourage advisory input from affected national entities;

(g) Examine and adapt existing relevant legislation to ensure its compliance with these guidelines.

States and international intergovernmental organizations should establish and promote regulations and policies that support the idea of minimizing the impacts of human activities on Earth as well as in the outer space environment. They are encouraged to prioritize their activities based on sustainable development goals, their main national requirements and international considerations for the sustainability of space and the Earth, due to the finite resources available in outer space and the emergence of unpredictable risks in the space environment due to the increasing level of space activities.

When developing, revising or amending national regulatory frameworks, States should ensure that the obligations under international law are implemented, including those specifically contained in the United Nations treaties on the exploration and use of outer space. In accordance with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, States and international intergovernmental organizations should address, establish and implement space debris mitigation measures through applicable mechanisms.

When creating regulatory frameworks, States should address risks to public health, safety and potential injury to persons or damage to property, taking into consideration the potential risks of space operations and the different liability regimes for damage occurring on Earth versus in space. Reducing risks to public health and safety should be considered as part of national regulations applicable to the launch, in-orbit operations and controlled re-entry of space objects. In this regard, States should consider the provisions of General Assembly resolution 68/74 on recommendations on national legislation relevant to the peaceful exploration and use of outer space. In cases of controlled re-entries of spacecraft or launch vehicle orbital and/or suborbital stages, States and international intergovernmental organizations should consider furnishing notices to aviators and mariners using already established procedures.

Due consideration should be given to international practices of spacefaring States and the development of new practices as a result of new technologies and capabilities. Ways to manage risks to public health and safety can include: quality assurance and risk management techniques; methodologies to assess probabilities of injury to people or damage to property from objects reaching the surface of the Earth from space or as a result of launch attempts; probabilistic risk assessments, hazard analyses and environmental impact studies that address the complete life cycle of space missions; implementation of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space for space operations using nuclear power; and measures for planetary protection.

When creating regulatory frameworks, States should also consider the potential benefits of using existing international technical standards, such as those published by the International Organization for Standardization (ISO), the Consultative Committee for Space Data Systems and national standardization bodies. In addition, States should consider the utilization of recommended practices and voluntary guidelines proposed by the Inter-Agency Space Debris Coordination Committee and the Committee on Space Research.

In developing regulatory measures applicable to the long-term sustainability of outer space activities, States should ensure that such measures are implementable and practicable in terms of the technical, legal and management capacities of the

State imposing the regulation, as a regulation should not require a technical innovation or exceed the current state of practice for the space activity being regulated.

Regulations should also be efficient in terms of limiting the cost for compliance (e.g., in terms of money, time or risk) compared with feasible alternatives, and be effective in that they have a clear intended purpose and accomplish their intended purpose. States should share with other States regulations and experience resulting from their implementation and consider information available on other States' regulatory frameworks when creating their own regulatory frameworks.

States should encourage advisory input from affected national entities during the process of developing regulatory frameworks governing space activities. The entities may include non-governmental entities, universities and research organizations operating under the jurisdiction of the State, agencies of the State or other bodies that play a role in space activities and that will be affected by the proposed regulatory initiative. By allowing early advisory input, the State can avoid unintended consequences of regulation that might be more restrictive than necessary or that conflicts with other legal obligations.

In developing or refining national regulatory frameworks, States should consider the need for appropriate transition periods and milestones for the implementation of measures to enhance the long-term sustainability of space activities.

States should commit, in their national legal frameworks, to conducting solely activities of a peaceful nature in the outer space environment. When doing so, States should bear in mind the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities[2] (guideline 38)

Conducting solely activities of a peaceful nature in the outer space environment would not prevent the conduct of monitoring activities, which are essential for national security but would represent a contribution to a regime of transparency and confidence-building measures. Insofar as States may have legitimate security interests in outer space, these interests must be subordinate to the interests of the whole of the international community.

Genuine military interests of States in outer space must be acknowledged. These must, however, be reconciled with the need for transparency in order to prevent conflict. Whenever States recognize an event or activity that may threaten their security interests, they are urged to engage in consultations, or any other communication process they deem suitable, to communicate their concerns and seek clarification of the purpose of the activities of another party. In like manner, States should refrain from conducting activities that may give rise to concerns by other States. In the event such activities should prove necessary, the State conducting them should endeavour to inform all potentially affected States and the Office for Outer Space Affairs.

[2] A/68/189.

Implementation of operational and technological measures of self-restraint to forestall adverse developments in outer space (guideline 39)

As part of defining, validating and supporting their space operations' tasks and requirements and space security-related guidance, operational principles and procedures, as well as identifying and employing appropriate capabilities in establishing and satisfying the needs in this area, States and international intergovernmental organizations should ensure that their related governmental agencies and establishments, respectively, as well as involved non-governmental entities under their jurisdiction and/or control, have a basic awareness of the need to align the objectives sought and the means employed by them with criteria and requirements attributable under international law, including the principles and norms of the Charter of the United Nations and the provisions of article IX of the 1967 Outer Space Treaty, and should make sure that such operations do not foster conflicts of interests and are not intrusive with regard to foreign space objects, unless such interference is expressly agreed to by the States or international intergovernmental organizations that exercise jurisdiction and/or control over them.

In undertaking space operations with a view to gathering information to acquire insight into objects, events and situations in near-Earth space orbit through required general surveillance and monitoring, which may presumably involve approaches at relatively short distances and fly-bys in close proximity compromising the safety and security of foreign space objects, States and international intergovernmental organizations should elaborate practical and effective safeguards to forestall adverse developments by restricting discretion in the use of techniques and selecting alternatives that would best satisfy the safety and security needs of foreign space objects.

To avoid the development of tensions or situations in outer space that could necessitate appropriate responses potentially involving procedures under articles 2, paragraph 4, and 51 of the Charter of the United Nations, States and international intergovernmental organizations, by taking full cognizance of limitations derived from international law and related internationally recognized standards to be followed when assessing and/or directing actions in outer space, should, as a general rule, refrain from applying to foreign space objects methods and techniques that they themselves would not deem pertinent and/or acceptable as applied to their own space objects.

States and international intergovernmental organizations, especially those that have relevant capacities and practices, should annually file with the Office for Outer Space Affairs valid statements and, as necessary, supplements/updates thereto, containing, in a generalized form, their assessment of the situation in outer space from the perspective of strategic considerations as well as characteristics (as detailed as they deem necessary) of the status of near-Earth outer space as an operating environment: specifically, phenomena and events which influence the security of outer space and should be comprehensively considered in evaluating threats and hazards for space activities.

States and international intergovernmental organizations should develop and implement criteria and procedures for the preparation and conduct of space activities aimed at the active removal of space objects from orbit (guideline 34)

States and international intergovernmental organizations considering or initiating execution of, or involvement in, operations for active removal of space debris,

functioning space objects and/or non-functioning space objects, should, in the process of making their judgements with regard to feasibility and safety of such operations and throughout their preparation and execution stages, thoroughly review and effectively implement a coherent set of stringent requirements and measures aimed at ensuring identification, analysis, evaluation and prevention of risks, as well as employing appropriate means and methods that would make such operations safe and fully consistent with the principles and norms of international law.

Decisions on risk mitigation methods and the choice of tools and techniques to implement active removal operations should reckon with the overriding task associated with the preclusion of any actions or omissions that could create vulnerability of, a threat to, and/or result in the loss of other State-, international intergovernmental organization- or foreign entity-owned or operated orbital systems, complexes and means, including operational malfunction, degradation or loss of integrity thereof, in part or whole, and thus impair or circumscribe rights and interests of the said States, international intergovernmental organizations or foreign entities. It should be commonly understood that any active removal operations:

(a) Rule out coercive technological impacts on the above-mentioned space assets in the absence of appropriately authenticated concurrence of, and authority explicitly conferred by, the State (including the State of registry), international intergovernmental organization and/or entity concerned;

(b) May not lead to any jurisdiction and/or control functions irregularities with regard to such foreign assets.

Implementation of a policy aimed at precluding interference with the operation of foreign space objects through unauthorized access to their on-board hardware and software (guideline 43)

By regulating and administering the functions involved in ensuring the safe and responsible conduct of space operations, States and international intergovernmental organizations, acting, inter alia, subject to the requirements of article VI of the 1967 Outer Space Treaty, should not directly or indirectly engage in, and/or associate themselves with, activities that support or assist any practice whereby any instruments and/or software that are, in functional terms, originally intended or purposefully modified for unauthorized interference in the regular operation of hardware and/or for unauthorized access to information systems of foreign space objects embedded in space objects and/or their components destined for export or use, through sale, lease or otherwise, by foreign recipients (users). Likewise, States and international intergovernmental organizations should require entities under their jurisdiction and/or control to provide guarantees (assurances) against any such practice on their part or that of their personnel or contractors (subcontractors) at any tier. The absence of any such embedded instruments and/or software should be officially attested by States or international intergovernmental organizations exercising jurisdiction and/or control with respect to manufacturers and suppliers of spacecraft and/or their components, as part of standing safety and security validation and assurance processes and/or at the request of the recipient (user). It should be a common understanding that any practice to the contrary, irrespective of motives that presumably could serve to substantiate it, and/or of the nature, scope, duration or intensity of the potential effect of any particular embedded instrument and/or software, or the engagement criteria used or ultimate objectives pursued in

that context, would entail serious implications for the safety of space operations since altered control programmes and any other component as may be embedded in space objects could, if conceivably activated, negatively affect the operational capabilities and mission sustainment of the space objects accommodating them and, specifically, escalate the risks of failures and increase the incidents/accidents probability.

Considering that any practice addressed by this guideline and purporting to exert an effect on foreign space objects such as to lead, in particular, to the compromising of command transmissions would intrinsically be fraught with the denial of rights and interests of States and international intergovernmental organizations that exercise jurisdiction and/or control over said assets in outer space, such practices should be qualified as violative of, and/or prejudicial to, the principles and norms of international law, specifically those deriving from article IX of the 1967 Outer Space Treaty, as well as the established criteria for good-faith practices and commercial integrity.

States and international intergovernmental organizations should give appropriate consideration to ways and means of providing for such a state of affairs where the understanding recorded in this guideline would be reinforced, directly by them and by non-governmental entities under their jurisdiction and/or control, through practical actions at the institutional and technical levels. Such efforts should be undertaken with a view to creating the prerequisites for consolidating international regulation in the area addressed by drafting and adopting a separate high-level policy document (for example, in the form of an international charter).

States should respect the security of foreign space-related ground and information infrastructures (guideline 35)

States and international intergovernmental organizations should consider the concept of and practices for ensuring the long-term sustainability of outer space activities as forming an integral whole with the issues of safety and security of ground infrastructure that provides the proper operation of, and receiving and processing of data from, orbital systems, complexes and means. Following the line of responsible and peaceful conduct of space activities, States and international intergovernmental organizations should, as part of providing overall institutional support for the concept of and practices for ensuring the long-term sustainability of outer space activities, adopt decisions that are reasoned and effectively formalized at policy and doctrine levels so as to exclude any actions that could impair or adversely affect the serviceability of such ground infrastructure under foreign jurisdiction and/or control.

Such a comprehensive approach requires collective acceptance of responsibilities by States and international intergovernmental organizations to establish and pursue, within the framework of their information security doctrines and strategies, including cybersecurity, and through active efforts at the international level, an information security policy that would appropriately address the need for, and modalities of, effective cooperation in preventing, identifying, investigating and deterring malicious usage of information and communications technologies and/or any other activities incompatible with the task of mitigating vulnerabilities of, and precluding disruptions to, critical national, foreign and international information infrastructures, that may be directly associated with ensuring safe and secure

operation of orbital systems, complexes and means under national or foreign jurisdiction. Consequently, States and international intergovernmental organizations should, whenever needed and/or as requested, establish liaisons and engage in practical interaction with each other in response to relevant real-time, emerging and potential threats and incidents in the segment under consideration.

States and international intergovernmental organizations should recognize that the security of terrestrial infrastructure is integral to space flight safety, which supports the long-term sustainability of outer space activities, and adopt policy measures relevant to security and resilience of terrestrial infrastructure upon which the operation of space systems and services depend (guideline 37)

Terrestrial infrastructure, including supporting information infrastructure, supports the proper operation of, and the receiving and processing of data from, space systems. States and international intergovernmental organizations should therefore strengthen the security and resilience of their own terrestrial infrastructure. Taking into account the principles of the Outer Space Treaty and the relevant provisions of the ITU Constitution, Convention and Radio Regulations, States and international intergovernmental organizations should avoid harmful interference with terrestrial infrastructure supporting the space activities of other States and international intergovernmental organizations.

States and international intergovernmental organizations party to the establishment and/or operation of a given terrestrial infrastructure for space activities are also encouraged to cooperate to strengthen the security and resilience of that terrestrial infrastructure. Such efforts could include information exchanges between and among governmental and non-governmental entities responsible for terrestrial infrastructure — via State authorities as necessary and in accordance with relevant applicable regulations — regarding effective practices for withstanding and recovering from accidents and incidents. States should designate points of contact for these information exchanges.

In considering appropriate levels of security and resilience of terrestrial infrastructures and supporting information infrastructure, States and international intergovernmental organizations should conduct a comprehensive impact assessment to consider the extent to which supported space systems provide critical services to national and foreign users.

Awareness of space activities (guidelines 7 + 8 + 15)

States and international intergovernmental organizations should raise general public awareness of the important societal benefits of space activities and of the consequent importance of enhancing the long-term sustainability of outer space activities. To this end, States and international intergovernmental organizations should:

(a) Promote institutional and public awareness of space activities and their applications for sustainable development, environmental monitoring and assessment, disaster management and emergency response;

(b) Conduct outreach, capacity-building and education on regulations and established practices relevant to the long-term sustainability of space activities;

(c) Promote activities of non-governmental entities that will enhance the long-term sustainability of outer space activities.

States and international intergovernmental organizations should promote public awareness of space applications for sustainable development, environmental monitoring and assessment, disaster management and emergency response through information-sharing and joint efforts with public institutions and non-governmental entities, taking into account the needs of current and future generations. In designing space education programmes, States, international intergovernmental organizations and non-governmental entities should pay special attention to courses on enhancing knowledge and practice of the utilization of space applications to support sustainable development. States and international intergovernmental organizations should initiate the voluntary collection of information on public awareness and education tools and programmes with a view to facilitating the development and implementation of other initiatives with similar objectives.

States and international intergovernmental organizations should foster outreach activities by or with industry, academia and other relevant non-governmental entities. Outreach, capacity-building and educational initiatives could take the form of seminars (in person or broadcast over the Internet), published guidelines to complement national and international regulations or an Internet website with basic information on a regulatory framework and/or a contact point within the Government for regulatory information. Appropriately targeted outreach and education can assist all space actors in gaining a better appreciation and understanding of the nature of their obligations, in particular relating to implementation, which can lead to improved compliance with the existing regulatory framework and the practices currently being employed to enhance the long-term sustainability of outer space activities. This is particularly valuable where the regulatory framework has been changed or updated, resulting in new obligations for participants in space activities.

Cooperation between Governments and non-governmental entities should be encouraged and fostered. Non-governmental entities, including professional and industry associations and academic institutions, can play important roles in increasing international awareness of issues associated with space sustainability, as well as promoting practical measures to enhance space sustainability. Such measures could include adoption of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space; compliance with the Radio Regulations of the International Telecommunication Union related to space services; and the development of open, transparent standards for the exchange of data necessary to avoid collisions, harmful radio frequency interference or other harmful events in outer space. Non-governmental entities can also play important roles in bringing stakeholders together to develop common approaches to certain aspects of space activities that can collectively enhance the long-term sustainability of space activities.

2. Scientific and technical guidelines

21. Guidelines [...] to [...] provide guidance of a scientific and technical nature for Governments, international intergovernmental organizations, and national and international non-governmental entities that conduct space activities. They encompass, among other things, the collection, archiving, sharing and dissemination

of information on space objects and space weather, and the use of standards for information exchange. These guidelines also address research into, and the development of, ways to support the sustainable use and exploration of outer space.

Research on and development of ways to support sustainable exploration and use of outer space (guidelines 3 + 5)

States and international intergovernmental organizations should promote and support research and development of sustainable space technologies, processes and services and other initiatives for the sustainable exploration and use of outer space, including celestial bodies.

In their conduct of space activities for the peaceful exploration and use of outer space, including celestial bodies, States and international intergovernmental organizations should take into account, with reference to the outcome document of the United Nations Conference on Sustainable Development (General Assembly resolution 66/288, annex), the social, economic and environmental dimensions of sustainable development on Earth.

States and international intergovernmental organizations should promote the development of technologies that minimize the environmental impact of [manufacturing and] launching space assets and that maximize the use of renewable resources and the reusability or repurposing of space assets to enhance the long-term sustainability of those activities.

States and international intergovernmental organizations should consider appropriate safety measures to protect the Earth and the space environment from harmful contamination, taking advantage of existing measures, practices and guidelines that may apply to those activities, and developing new measures as appropriate.

States and international intergovernmental organizations conducting research and development activities to support the sustainable exploration and use of outer space should also encourage the participation of developing countries in such activities.

Data on space objects (guidelines 24 + 26)

States and international intergovernmental organizations should promote the development and use of techniques and methods to improve the accuracy of orbital data for spaceflight safety and the use of common, internationally recognized standards when sharing orbital information on space objects.

Recognizing that spaceflight safety strongly depends upon the accuracy of orbital and other relevant data, States and international intergovernmental organizations should promote techniques and the investigation of new methods to improve such accuracy. Those methods could include national and international activities to improve the capabilities and geographical distribution of existing and new sensors, use of passive and active on-orbit tracking aids, and combining and validating data from different sources. Special attention should be paid to encouraging the participation and capacity-building of developing countries with emerging space capabilities in this domain.

When sharing orbital information on space objects, operators and other appropriate entities should be encouraged to use common, internationally recognized standards

to enable collaboration and information exchange. Facilitating greater shared awareness of the current and predicted location of space objects would enable timely prediction and prevention of potential collisions.

Perform conjunction assessment during orbital phases of controlled flight (guideline 25)

States and international intergovernmental organizations should perform conjunction assessment during orbital phases of controlled flight. States should ensure that non-governmental entities carrying out their national activities in outer space perform such conjunction assessment.

Conjunction assessment with other space objects should be performed for all spacecraft capable of adjusting trajectories during orbital phases of controlled flight for current and planned spacecraft trajectories.

Appropriate steps of the conjunction assessment process include improving the orbit determination of relevant space objects, screening current and planned trajectories of relevant space objects for potential collisions, and determining whether an adjustment of trajectory is required to reduce the risk of collision, in coordination with other operators and/or organizations responsible for conjunction assessment, as appropriate.

States and international intergovernmental organizations should develop and implement common approaches to conjunction assessment.

Spacecraft operators, including those of non-governmental entities, that are unable to perform conjunction assessments, should be encouraged to seek support, via State authorities, as necessary and in accordance with relevant applicable regulations, from appropriate around-the-clock conjunction assessment entities.

Achievement of basic understanding and development of practical approaches with regard to identifying, in the course of the preparation and conduct of launches, probable conjunctions of newly launched objects with objects already present in near-Earth space (guideline 41)

States and international intergovernmental organizations should be urged to consider the pre-launch assessment of possible conjunctions and collisions of newly launched space objects with space objects already present in near-Earth orbit, as well as international coordination of planned on-orbit operations, as prospectively rewarding from the standpoint of managing the safety of space operations. States and international intergovernmental organizations should undertake efforts on a continuous basis and in a sufficiently consistent and integrated fashion to endorse the development and implementation, as technically feasible, of their long-term policy requirements designed to adequately address and accomplish this task. Conditions for the proactive engagement of States and international intergovernmental organizations in cooperative relationships and for the establishment, in the long term, of an appropriate operative information-sharing framework could include the development and use of a common international standard for representing and sharing appropriate information on the nominal flight trajectory of a launch vehicle during the insertion of spacecraft (payloads). [Notwithstanding bilateral or multilateral forms of cooperation as may be deemed feasible by relevant participants, States and international intergovernmental

organizations should, when performing a pre-launch assessment of potential conjunctions and collisions of newly launched space objects with space objects already present in near-Earth orbit, duly avail themselves of the opportunities and benefits for the gathering and distribution of trajectory information on space objects already in outer space that are afforded by the centre for information on near-Earth space monitoring, under the auspices of the United Nations.]

In order to ensure the development of cooperative activities involving the sharing of detailed data and the elaboration of appropriate procedures for the purposes of the safety of space operations, States and international intergovernmental organizations should be encouraged to provide, where possible, pre-launch notifications containing information on planned dates and times of scheduled launches, types of launch vehicles and basic information on space objects planned for insertion into orbit with reference to the destination regions of near-Earth outer space where newly launched objects are intended to be placed and/or basic parameters of nominal orbit for each object and the possible dispersion of their values. It should be the general understanding that recourse to pre-launch notifications featuring provision of both sets of information identified above could, as an internationally recognized practice, acquire a stable pattern and be sustained as a routine shared standard of action parallel to the enhancement of the space security regime, including, inter alia, transparency and confidence-building measures in outer space activities. Such a favourable combination of factors would serve to eliminate the motivational issues that may inhibit the formation of a comprehensive practice in this area. Special attention must be given to address, as an immediate task, the issue of placing into the practical implementation perspective a procedure for providing information on planned dates and time of scheduled launches, types of launch vehicles and basic information on space objects planned for insertion into orbit with reference to the destination regions of near-Earth outer space where newly launched objects are intended to be placed, as this would require significantly less effort for the new technical and associated procedures to be introduced and simultaneously provide a focused matching of solution to need and practical opportunity.

States and international intergovernmental organizations, acting in compliance with statutory tasks and responsibilities under their legislative and conventional regulations, should, through achievable and pragmatic steps, support and reinforce the potential for partnership with industry and ensure prerequisites for concerted activity on its part with a view to initiating and/or continuously proceeding with studying and exploring concepts of upgrading launch vehicle control systems that would permit the introduction of a procedure for making changes in flight programmes in order to ensure rapid response to unforeseen collision risks during an actual launch. States and international intergovernmental organizations should undertake efforts to develop and use a standard format for the generation and pre-launch sharing of information on nominal orbital parameters and probable dispersion of their values for each space object planned for separation and independent insertion into a target orbit in order to allow assessment of possible encounters and coordinate planned in-orbit operations accordingly. The experience gained and methods developed should, accordingly, be summarized and should be sought to be institutionalized and, in due course, be covered by spaceflight safety planning and launch readiness reporting procedures as far as technically and otherwise practicable. States and international intergovernmental organizations should be encouraged to address the task of achieving, through appropriate

mechanisms, commonality or convergence of the practices developed and to promote their use to meet the objectives of practical and effective safety measures.

Promotion of research on orbital debris and sharing of space debris monitoring information (guideline 21)

States and international intergovernmental organizations should promote the collection, sharing and dissemination of space debris monitoring information and international scientific cooperation in this area.

States and international intergovernmental organizations should encourage the development and use of relevant technologies for the measurement, monitoring and characterization of the orbital and physical properties of space debris. States and international intergovernmental organizations should also promote the sharing and dissemination of derived data products and methodologies in support of research and international scientific cooperation on the evolution of the orbital debris population.

An international space debris fund could be established under the auspices of the Office for Outer Space Affairs in order to support activities that remove or mitigate current space debris, prevent the creation of future space debris and/or reduce the impacts of space debris. Member States, especially the leading States in space activities, might be encouraged to consider allocating a percentage of their budget for space activities to this fund in order to enhance the long-term sustainability of outer space activities, support sustainable development on Earth, and support the sustainable utilization of space.

States and international intergovernmental organizations with experience in space activities should also encourage and support capacity-building in developing countries with emerging space programmes to improve their expertise on spacecraft design and knowledge of flight dynamics and orbits through the performance of joint orbital calculations, conjunction assessments and collision avoidance procedures. This will require access to precise orbital data and appropriate tools for the monitoring of space objects. In this regard, consideration should be given to the development, on a mutually acceptable basis, of appropriate collaborative activities in space situational awareness and to arranging financing of projects in this regard.

Modalities for ascertaining substantively relevant bases for addressing and meeting requirements for the safe conduct, in extreme cases, of operations resulting in the destruction of in-orbit space objects (guideline 44)

States and international intergovernmental organizations, while fully adhering to the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, in particular as regards the need to avoid intentional destruction of on-orbit spacecraft, are entitled to preserve options and pursue solutions that could provide for such destruction of space objects under their jurisdiction and/or control when alternatives to such operations would persuasively have far more negative consequences (as may presumably be warranted, for instance, in the context of international efforts to counter an asteroid hazard). Notwithstanding the concept outlined above, it should be generally understood that, as part of ensuring the long-term sustainability of outer space activities and preserving outer space as a safe, stable and conflict-free environment, the intentional destruction of space

objects in near-Earth orbits is to be avoided. In this connection every hypothetical case where a State or international intergovernmental organization faces an absolute need to perform an operation leading to the destruction of a space object under its jurisdiction and/or control (i.e., when circumstances of its flight afford no other technical option but such destruction) should be duly substantiated, with the destruction operation compellingly described as an unavoidable measure to avert immediate or potential serious threat to human life, the environment or property in outer space or, in case of the predicted entry of a space object into the Earth's atmosphere, on the ground, in the air or at sea. Furthermore, any operation that could result, through mechanical impact or the use of other means, in direct or indirect damage to or destruction of space objects under foreign jurisdiction (foreign control) should not be contemplated unless explicitly agreed to by the States/international intergovernmental organizations that exercise jurisdiction and control over such space objects.

Well in advance of proceeding, on legitimate grounds, with the operation for the destruction of an in-orbit space object, States and international intergovernmental organizations should take care to ensure adherence to a procedure for reporting on the circumstances of such operations that should provide for the basic elements outlined below. States and international intergovernmental organizations should, through the Office for Outer Space Affairs as well as other relevant channels when necessary, keep the international community appropriately informed of the circumstances that warrant such an operation and additionally inform it, as necessary, on how the evolving situation is assessed. It should be a general principle that the greater the probability of forecasted side effects from an operation, the more nuanced should be the information made available internationally at different stages of the operation's preparation and implementation. Where practicable, the prerequisites for organizing the provision of information in an expeditious reactive mode or in near real-time mode should be properly considered. When developing sets of decisions that presume and substantiate an operation for the destruction of a space object, States and international intergovernmental organizations should provide for safety assurance measures that would include warranted and substantive safeguards, to the extent that such measures are deemed practicable and satisfactory.

Integrating and sustaining a shared cross-functional perception of, and definition of incremental steps to ensure, the safe implementation of operations for the active removal and intentional destruction of space objects, specifically as applied to non-registered objects (guideline 45)

In the course of applying the guidelines on active removal and/or intentional destruction of space objects at the stage of designing and implementing relevant operations, States and international intergovernmental organizations should align such activities with the provisions of this guideline which supplies and reinforces major criteria for supporting individual and common interests as they should be understood in the context under consideration, including when procedures under the Registration Convention have not been effectuated with regard to objects launched into outer space. States and international intergovernmental organizations should ensure completeness of regulation of the said operations on the basis of a fully integrated approach in order to avoid any loose, random or abusive practices.

States and international intergovernmental organizations should proceed from the understanding that securing legitimate grounds for operations for active removal/intentional destruction is directly contingent on the reliability achieved in establishing that a specific space object (whether or not registered in the Register of Objects Launched into Outer Space) planned for removal/destruction and a specific physical object in orbit that is presumed to be/is associated with such space object represent one and the same physical body. Positive identification of the object to be actively removed or intentionally destroyed should be perceived as the determining (decisive) factor in the process of deciding to proceed with the operation. Accordingly, until the origin and status of a specific physical object are determined in a sufficiently convincing and precise way, that object should not be regarded as an immediate (established) target for active removal/intentional destruction operation. States and international intergovernmental organizations should consistently seek to concert their efforts aimed at establishing and maintaining procedures and mechanisms that would make it possible to effectively address and satisfy individual and common needs in the identification of objects in orbit.

Operations for active removal/intentional destruction should be preceded by thorough analysis of all feasible methods of their implementation, including an assessment of the risks entailed by each method. The degree to which the international community is to be informed about the technical aspects of the method chosen for implementing the operation is to be determined at the discretion of States and/or international intergovernmental organizations that plan and conduct such operations, with the understanding that the overall information support required for the purposes of safety of space operations should be adequately provided by them through the Office for Outer Space Affairs and, in addition, through other relevant channels. Such operations should be secured informationally and technically by the States and international intergovernmental organizations planning and conducting them. Other States and international intergovernmental organizations should, as far as possible and upon request, provide informational and analytical support for such operations. Apart from the provision of valid near-Earth space monitoring information and the results of space situational analysis (if such results are available), such support may also include assistance in identifying relevant space objects on the basis of analysis of the accessible monitoring-information archives and posting of the results of such analysis for general access and use.

Considering specific features that characterize the development of the practice of applying the Registration Convention and are conditioned by differing views on the function of registration of all component parts of space objects and/or launch vehicles which either do not, ab initio, possess (due to their technologically inherent features) the ability to operate independently or else turn out to be incapable (due to contingencies) of sustained operational capabilities for the mission-specified time period, States and international intergovernmental organizations should, by way of applying the guidelines on active removal and/or intentional destruction of space objects and with a view to enhancing practice in registering space objects, proceed from the following understanding:

(a) The body of rules governing the title to, and status of, a space object, as established under international law, should be understood to be based on the interaction of factors that relate to the precise and operationally conditioned interpretation of the legal status of component parts of space objects and launch

vehicles as well as of space objects that have not been capable ab initio or else have lost the capability to perform their assigned functions, as applied to cases where States and international intergovernmental organizations do not perform the dedicated registration of such component parts and objects, and of other factors that in any case have continued relevance and, in the light of the rights and obligations provided for in articles VII and VIII of the 1967 Outer Space Treaty, should not be dispensed with;

(b) The fact of non-registration of component parts of objects and, when relevant, objects as described in subparagraph (a) above that result from a space launch or contingencies during the flight of a space object should not in itself be construed as grounds for considering such component parts and objects to be devoid of title, taking into account, inter alia, the requirements of the Convention on International Liability for Damage Caused by Space Objects of 29 March 1972; and the absence of specific information on the said component parts and objects either in the registration information or as a reference to registration entries should not serve to substantiate the divesting of jurisdiction and control over such component parts or objects;

(c) Full concurrence with the practical observations contained in subparagraphs (a) and (b) above should not decrease the motivation on the part of States and international intergovernmental organizations with regard to identifying and configuring, as appropriate, pragmatic and feasible policies that would be instrumental for the ascertainment by the launching State, and/or the international intergovernmental organization that has accepted relevant rights and obligations, of the status of non-registered component parts of space objects or non-functioning space objects under their jurisdiction and control, with the possible outcome being voluntary decisions on the part of the said States and/or international intergovernmental organizations to waive, in whole or in part, the authority they exercise with respect to such component parts of space objects or non-functioning spacecraft so as to make it possible to develop a framework for taking decisions on clearing outer space of space debris;

(d) The approach outlined in subparagraph (c) should assist States/international intergovernmental organizations in entering into potential joint decisions and arrangements that could fully accommodate requests for well-defined and validated obligations and technical procedures for the implementation of space debris removal operations where such operations have been determined by the parties to such joint decisions and arrangements to be a prioritized requirement/prioritized task.

By way of defining the particular features of the status of fragments (irrespective of their linear dimensions) resulting from break-ups of space objects for whatever reason or from the conduct of technological operations in orbit, consideration should be given to the fact that, for objective reasons, they may not be subject to registration due to the very nature of their origin, their physical condition and the impossibility of determining and regularly updating the parameters of their orbital movement. In order to assess the feasibility of their registration, the degree of reliability with which each particular fragment can be correlated with another identified space object that may be assumed to be the object of its origin and/or with an event that led to its appearance or formation in orbit should be correctly evaluated. States and international intergovernmental organizations wishing to

register fragments which they, based on the results of identification, regard as having relevance to space objects previously registered by them should direct to the Office for Outer Space Affairs confirmation of intention to perform registration of such fragments, accompanied by information on planned applications and requests to have such information posted on a relevant information resource of the Office. It should be presumed in this context that a strictly limited period of time is to be allotted for the receipt from other States and/or international intergovernmental organizations of objections to such registration, given that the relevance of the orbital information decreases steadily unless it is updated. States and international intergovernmental organizations planning to direct requests may, at their own discretion, update, to the extent necessary, the orbital parameters of fragments that they have provided and/or show readiness to transfer such information at the request of interested States and international intergovernmental organizations. In case the requests encounter motivated objections they are to be recalled, and the differences that have arisen should be the subject of international consultations.

The shared vision of the practical aspects of addressing and resolving the interrelated issues of the safety of space operations and space debris mitigation should include the allowance for States and international intergovernmental organizations, to provide consistently with their authority and responsibilities in accordance with, and by implication of, the relevant principles and norms of the 1967 Outer Space Treaty, for options that would envisage adjustments to the status of space objects under their jurisdiction and control (including objects that originated from such space objects) which have ceased to function or to be functional, so as to provide definitive eligibility with regard to potential international efforts to clear outer space of space debris. Such practice may, in particular, be validated as an operational necessity with regard to space debris fragments if it is convincingly established that such fragments have irretrievably lost the ability to function or sustain functionality and that lifting constraints on their removal could be the best solution. The entire set of relevant activities should be motivated by a strict procedure whereby States and international intergovernmental organizations make official announcements that they anticipate the need for such an adjustment of status while maintaining, as technically feasible, exact and necessary correlation with their liabilities under international law. The decisions planned for adoption and actually adopted should be explicit as to the context in which specific rights to exercise functions involved in determining the treatment of such objects would either be conferred (assigned) or waived. The feasibility and expediency of authorizing such practices and rendering them valid should be determined on a case-by-case basis. Acting in implementation of article IX of the 1967 Outer Space Treaty, States and international intergovernmental organizations, while strictly adhering to the understanding outlined above, should, by increasing their level of involvement in focused cooperative activities, work on integrating, as necessary, the different aspects of such activities on the basis of relevant agreements to provide for specific solutions in this area. Within such agreements criteria should be designed and leveraged to further define liabilities and allocate respective duties among all participants in the activities planned. Such agreements should prescribe applicable procedures for regulating access to a space object and/or its component parts as well as measures to protect technology, where such procedures and measures are necessary and feasible in practical terms.

Development of space weather models and tools and collection of established practices on the mitigation of space weather effects (guidelines 28 + 30)

States and international intergovernmental organizations should support and promote the development of advanced space weather models and forecasting tools and the collection, sharing and dissemination of, and access to, information relating to established practices for mitigating the effects of space weather on terrestrial and space-based systems, as a means of enhancing the long-term sustainability of space activities.

States and international intergovernmental organizations should undertake a coordinated approach to identifying and filling gaps in research and operational models and forecasting tools required to meet the needs of the scientific community and of the providers and users of space weather information services. Where necessary, this should include coordinated efforts to support and promote research and development to further advance space weather models and forecasting tools, incorporating the effects of the changing solar environment and evolving terrestrial magnetic field as appropriate, including within the context of the Committee on the Peaceful Uses of Outer Space and its Subcommittees, as well as in collaboration with other entities such as the World Meteorological Organization and the International Space Environment Service.

States and international intergovernmental organizations should support and promote cooperation and coordination on ground- and space-based space weather observations, forecast modelling, satellite anomalies and reporting of space weather effects in order to safeguard space activities. Practical measures in this regard could include:

(a) Incorporating current and forecast space weather thresholds into space launch criteria;

(b) Encouraging satellite operators to cooperate with space weather service providers to identify the information that would be most useful to mitigate anomalies and to derive recommended specific guidelines for on-orbit operations. For example, if the radiation environment is hazardous, this might include actions to delay the uploading of software, implementation of manoeuvres, etc.;

(c) Encouraging the collection, collation and sharing of information relating to ground- and space-based space weather-related impacts and system anomalies, including spacecraft anomalies;

(d) Encouraging the use of a common format for reporting space weather information. In relation to the reporting of spacecraft anomalies, satellite operators are encouraged to take note of the template proposed by the Coordination Group for Meteorological Satellites;

(e) Encouraging policies promoting the sharing of satellite anomaly data;

(f) Encouraging training on and knowledge transfer relating to the use of space weather data, taking into account the participation of [developing] countries with emerging space capabilities.

It is acknowledged that some data may be subject to legal restrictions and/or measures for the protection of proprietary or confidential information.

States and international intergovernmental organizations should work towards the development of international standards and the collection of established practices applicable for the mitigation of space weather effects in satellite design. This could include sharing of information on design practices, guidelines and lessons learned relating to mitigation of the effects of space weather on operational space systems, as well as documentation and reports relating to space weather user needs, measurement requirements, gap analyses, cost-benefit analyses and related space weather assessments.

States should encourage entities under their jurisdiction and/or control to:

(a) Incorporate in satellite designs the capability to recover from a debilitating space weather effect, such as by including a safe mode;

(b) Incorporate space weather effects into satellite designs and mission planning for end-of-life disposal in order to ensure that the spacecraft either reach their intended graveyard orbit or de-orbit appropriately, in accordance with the Space Debris Mitigation Guidelines of the Committee. This should include appropriate margin analysis.

International intergovernmental organizations should also promote such measures among their member States.

States should undertake an assessment of the risk and socioeconomic impacts of adverse space weather effects on the technological systems in their respective countries. The results from such studies should be published and made available to all States and used to inform decision-making relating to the long-term sustainability of outer space activities, particularly with regard to mitigating the adverse impacts of space weather on operational space systems.

Sharing operational space weather data and forecasts (guidelines 27 + 29)

States and international intergovernmental organizations should support and promote the collection, archiving, sharing, intercalibration, long-term continuity and dissemination of critical space weather data and space weather model outputs and forecasts, where appropriate in real time, as a means of enhancing the long-term sustainability of outer space activities.

States should be encouraged to monitor space weather continuously and to share data and information with the aim of establishing an international space weather database network.

States and international intergovernmental organizations should support the identification of data sets critical for space weather services and research and should consider adopting policies for the free and unrestricted sharing of critical space weather data from their space- and ground-based assets. All governmental, civilian and commercial space weather data owners are urged to allow free and unrestricted access to, and archival of, such data for mutual benefit.

States and international intergovernmental organizations should also consider sharing real-time and near-real-time critical space weather data and data products in a common format, promote and adopt common access protocols for their critical space weather data and data products, and promote the interoperability of space weather data portals, thus promoting ease of data access for users and researchers.

The real-time sharing of these data could provide a valuable experience for sharing in real time other kinds of data relevant to the long-term sustainability of outer space activities.

States and international intergovernmental organizations should further undertake a coordinated approach to maintaining the long-term continuity of space weather observations and identifying and filling key measurement gaps, so as to meet critical needs for space weather information and/or data. Consideration should be given to flying small and low-power integrated payloads for space weather science and monitoring whenever and wherever possible (e.g., radiation monitors on Earth-orbiting satellite missions).

States and international intergovernmental organizations should identify high-priority needs for space weather models, space weather model outputs and space weather forecasts and adopt policies for free and unrestricted sharing of space weather model outputs and forecasts. All governmental, civilian and commercial space weather model developers and forecast providers are urged to allow free and unrestricted access to and archival of space weather model outputs and forecasts for mutual benefit, which will promote research and development in this domain.

States and international intergovernmental organizations should also encourage their space weather service providers to:

(a) Undertake comparisons of space weather model and forecast outputs with the goal of improved model performance and forecast accuracy;

(b) Openly share and disseminate historical and future critical space weather model outputs and forecast products in a common format;

(c) Adopt common access protocols for their space weather model outputs and forecast products to the extent possible, to promote their ease of use by users and researchers, including through interoperability of space weather portals;

(d) Undertake coordinated dissemination of space weather forecasts among space weather service providers and to operational end users.

Prevention of dangerous alterations of space environment parameters resulting from intentional modifications (guideline 42)

States and international intergovernmental organizations should support a clear understanding that challenges associated with ensuring the safe and responsible conduct of space operations provide an imperative to focus on the avoidance and management of crisis situations that may be associated with a misuse of technologies and technical means of intentional modification of the natural space environment, thereby posing threats to, and/or causing vulnerabilities of, space systems. Acting to uphold, through participation and/or application, vigilant compliance with the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, which was opened for signature on 18 May 1977 and entered into force on 5 October 1978, States and international intergovernmental organizations should, in furtherance of the aggregate concept characteristic of that Convention, prioritize those aspects and criteria that meet the safety needs of space operations. States and international intergovernmental organizations should agree that the use of environmental modification techniques for peaceful purposes, formally not hindered by the Convention, may, unless

supported by criteria and procedures critical to safety, damage or harm the operational space objects in orbit and thus cause widespread and/or long-lasting, and/or severe effects under the Convention, in the sense that such effects may pose immediate and/or projected threats of fragmentation of foreign or any other space objects and result in the mass proliferation of space debris hindering use of the orbit.

For the purposes of this guideline, deliberate manipulation of natural processes shall mean intentional alteration of the characteristics of the space environment (electronic concentration and temperature of the ionosphere, density and chemical composition of the upper atmosphere, intensity of electromagnetic emissions, and characteristics of radiation belts, including the creation of artificial radiation belts). Accordingly, when planning and conducting outer space activities, States and international intergovernmental organizations should not engage in and/or allow entities under their jurisdiction and control to engage in the use of modification techniques that could impact the condition of the space environment in a way that would negatively (in addition to objective factors of the space environment) influence operational spacecraft and associated means of ground infrastructure to a degree either equivalent to or comparable to effects described in article I of the Convention. States and international intergovernmental organizations should be fully aware that such negative influence may lead to the incapacitation of operational spacecraft and associated means of ground infrastructure and, consequently, the increase in the number and frequency of collisions and the proliferation of small objects (particles) of space debris, interference in space radio links, failures in space objects' control processes, on-board equipment and navigation systems, and the distortion of radio signals used in technical means for measuring the trajectory parameters of space objects.

States and international intergovernmental organizations should give issues that form the substance of this guideline proper preventive and reactive regulation applicable to activities they or their related entities conduct or participate in, which would include:

(a) Enhancing awareness of the risks associated with any deliberate manipulation of natural processes in the context provided for in this guideline, as well as advancing a systemic approach to assessing and controlling such risks;

(b) Designing and implementing administrative, operational and technological restraints, respectively, at the stage of establishing and throughout the implementation path of experiments or other types of activity involving any deliberate manipulation of natural processes in the context provided for in this guideline;

(c) Setting safety-critical parameters of the space environment with regard to the scale and effect of any minor manipulations of natural processes in the context provided for in this guideline, so that the use of such manipulation techniques does not result in damaging phenomena.

Notwithstanding paragraph 2 of article III of the Convention and without prejudice to the procedures provided for in the guideline "Sharing operational space weather data and forecasts", should a fact be established, in the context of implementation of this guideline, that safety-critical values of space environment parameters have been reached, States and international intergovernmental organizations should be open for consultation and/or provision of information, if available, in the event of a

request on the part of other States and international intergovernmental organizations interested in such consultations and/or information for good and valid reasons.

Investigation and consideration of new measures to manage the space debris population (guideline 36)

States and international intergovernmental organizations should investigate the necessity and feasibility of new measures, including technological solutions, and consider such measures with the aim of managing the space debris population in the long term.

Although improved sharing of data on space objects and the implementation of collision avoidance measures will make a significant contribution to promoting the sustainability of outer space activities, such collision avoidance measures are only applicable to the very small fraction of the total number of space objects in orbit that have the capability to change their trajectory. For the large majority of space objects, collisions are unavoidable and will contribute to the steady increase of orbital debris over time, thus jeopardizing the long-term sustainability of outer space activities.

States and international intergovernmental organizations should therefore investigate the necessity and feasibility of possible new measures, including technological solutions, and consider implementation thereof, in order to address the evolution of the space debris population. Such new measures to be investigated could include, inter alia, on-orbit servicing and other methods for operational lifetime extension, active debris removal, "just-in-time" collision avoidance measures for objects with no means to change their trajectory, including space debris, novel techniques for spacecraft passivation and end-of-life disposal, and a possible reduction in the currently recommended 25-year orbital lifetime for spacecraft in low-Earth orbit after the end of orbital operations.

Investigation of new measures to ensure the sustainability of space activities that involve either controlled or uncontrolled re-entries should not increase risks of injury to people, or damage to property or the environment. In this regard, States and international intergovernmental organizations should share knowledge and experience gained from a "design-for-demise" philosophy whereby space systems are intentionally designed to completely ablate during uncontrolled atmospheric re-entry as a means of end-of-life disposal.

Policy and legal issues, such as ensuring that these new measures are compliant with the provisions of the Charter of the United Nations and applicable international law, may also need to be addressed.

3. International cooperation and capacity-building guidelines

22. Guidelines [...] to [...] provide guidance on international cooperation measures aimed at promoting the long-term sustainability of outer space activities for Governments and relevant international intergovernmental organizations authorizing or conducting space activities. The guidance includes measures to promote technical cooperation and capacity-building to improve the ability of developing countries to establish their own national capacities, in accordance with national legislation, multilateral commitments, non-proliferation norms and international law.

International cooperation in support of the long-term sustainability of outer space activities (guidelines 16 + 18)

States and international intergovernmental organizations should promote and facilitate international cooperation in the peaceful uses of outer space on a mutually acceptable basis, without infringing intellectual property rights and in accordance with relevant international non-proliferation obligations and national legislation and regulations.

[*Two alternative formulations for the supporting text of this guideline are given below for the consideration of delegations.*]

[*Alternative 1*]

[All States, particularly those with relevant space capabilities and with programmes for the exploration and use of outer space, should contribute to promoting and fostering international cooperation in the long-term sustainability of space activities on a mutually acceptable basis. In this context, particular attention should be given to the benefits for and interests of developing countries and countries with incipient space programmes. States are free to determine all aspects of participation in the exploration and use of outer space on a mutually acceptable basis. The terms of such cooperative ventures, for example in contracts and other legally binding mechanisms, should be fair and reasonable.

States undertaking, authorizing or intending to undertake or authorize international space activities involving the use of controlled items (objects, materials, manufactured items, equipment, software or technology) whose unauthorized disclosure and onward transfer are prohibited and thus warrant appropriate levels of control should ensure that such activities are conducted in accordance with multilateral commitments, non-proliferation norms and principles and international law, and respect intellectual property rights, irrespective of whether such activities are carried out by governmental or non-governmental entities or through international intergovernmental organizations to which such States belong.

States concerned should establish appropriate legal and administrative regulations relating to cooperation in cases where such controlled items are exported or imported, and seek to forge collaborative relationships based on mutual benefits and equal advantages with regard to safeguarding controlled items. States should ensure, by means of agreements or other arrangements which are properly institutionalized under national legislation, the safety and security of imported controlled items while they are in the territory of the importing State. In particular, States should enter into consultations to reach agreement in relation to:

(a) Post-sale monitoring and verification to ascertain that controlled items are not at risk of unauthorized use or onward transfer;

(b) Strengthening end-use certification and authentication procedures at the State level;

(c) Providing legal supervision of contracts and contract-based activities in order to effectively facilitate the proper application of agreed measures on end use and to prevent any circumstances in which exported controlled items, when located in the territory of the importing State, could become the subject of disputed jurisdiction or be used for illicit purposes;

(d) Ensuring that the relevant State bodies have the power and capacity to monitor the end use of controlled items and to take appropriate measures where there is a presumption of non-compliance with non-proliferation norms and principles regarding end use.]

[*Alternative 2*]

[This guideline applies to all modes of cooperation, including governmental and non-governmental, commercial and scientific; global, multilateral, regional or bilateral; and among countries at all levels of development. All States, particularly those with relevant space capabilities and with programmes for the exploration and use of outer space, should contribute to promoting and fostering international cooperation in the long-term sustainability of space activities on a mutually acceptable basis. In this context, particular attention should be given to the benefits for and interests of developing countries and countries with incipient space programmes stemming from such international cooperation conducted with countries with more advanced space capabilities. States are free to determine all aspects of participation in the exploration and use of outer space on a mutually acceptable basis. The terms of such cooperative ventures, for example through contracts and other legally binding mechanisms, should be fair and reasonable.

States and international intergovernmental organizations should consider promoting international technical cooperation to enhance the long-term sustainability of outer space activities and support sustainable development on Earth. States and international intergovernmental organizations should support current initiatives and consider new forms of regional and international collaboration to promote space capacity-building, taking into account the needs and interests of developing countries and in accordance with relevant international non-proliferation obligations and national legislation and regulations. States and international intergovernmental organizations should also promote technology safeguard arrangements that may facilitate space capacity-building, while respecting intellectual property rights and relevant requirements for long-term sustainability.

States concerned should establish stronger legal and administrative regulation relating to such cooperation. States should seek to forge collaborative relationships based on equality and mutual benefits. To maximize the potential benefits of such collaboration, States should provide, by means of agreements or arrangements, for the implementation of measures, institutionalized appropriately under their national legislation.]

Sharing of experience related to the long-term sustainability of outer space activities and procedures for information exchange (guidelines 1 + 2)

States and international intergovernmental organizations should share experience and expertise relating to the long-term sustainability of outer space activities and to develop and adopt procedures to facilitate the compilation and effective dissemination of information that will enhance the long-term sustainability of space activities.

The experience and expertise acquired by those engaged in space activities are instrumental in the development of effective measures to enhance the long-term sustainability of outer space activities. States and international intergovernmental

organizations should therefore share relevant experience and expertise in order to facilitate and enhance the development of guidelines, rules, regulations and practices to enhance the long-term sustainability of space activities. New participants and those with very little experience in space activities will benefit from the experience and expertise of other space actors, and established actors will also find value in developing new partnerships and sharing experiences more widely.

In developing their procedures for sharing information to enhance the long-term sustainability of space activities, States and international intergovernmental organizations should adopt procedures that permit sharing information with non-governmental entities, in addition to sharing information between States, national regulatory authorities, government agencies and international intergovernmental organizations. In further developing their information-sharing procedures, States and international intergovernmental organizations could take note of effective data-sharing mechanisms applied by non-governmental entities.

Capacity-building (guidelines 17 + 19 + 31)

States and international intergovernmental organizations should support and promote capacity-building in scientific, technical and legal capabilities and improved data accessibility as means of promoting the long-term sustainability of outer space activities.

States and international intergovernmental organizations should support current capacity-building initiatives and promote new forms of regional and international cooperation and capacity-building that are in accordance with national and international law to assist countries in gathering human and financial resources and achieving efficient technical capabilities, standards, regulatory frameworks and governance methods that support the long-term sustainability of outer space activities and sustainable development on Earth.

Capacity-building activities include education, training and sharing of appropriate experience, information, data, tools, and management methodologies and techniques, as well as the transfer of technology. States and international intergovernmental organizations should coordinate their efforts in space-related capacity-building and data accessibility in order to ensure efficiency in the use of available resources and, to the extent that it is reasonable and relevant, avoid unnecessary duplication of functions and efforts, taking into account the needs and interests of developing countries.

States and international intergovernmental organizations should also undertake efforts to make relevant space-based information and data accessible to countries affected by natural disasters or other catastrophes, applying the principles of humanity, neutrality and impartiality, and to support capacity-building activities aimed at enabling the receiving countries to make optimal use of such data and information. These space-based data and information with appropriate spatial and temporal resolution should be freely, quickly and easily available for the countries in crisis.

Capacity-building activities can make a significant contribution to enhancing the long-term sustainability of outer space activities by building on the knowledge gained by States and international intergovernmental organizations over many years

in the conduct of space activities. In particular, sharing of such experience can enhance the safety of space activities and benefit all users of outer space. Therefore, States and international intergovernmental organizations with experience in space activities should encourage and support capacity-building in developing countries with emerging space programmes, on a mutually acceptable basis, through measures such as improving their expertise and knowledge on spacecraft design, flight dynamics and orbits, performing joint orbital calculations and conjunction assessments, and providing access to precise orbital data and appropriate tools for monitoring of space objects, as well as through the arranging of financing for projects on those subjects.

C. Implementation and updating

1. Implementation

23. Without prejudice to the sovereign right of States to determine and establish their own control mechanisms for implementing their international obligations under existing treaties and principles governing the activities of States in the exploration and use of outer space, States are encouraged to implement the guidelines presented above to the greatest extent practicable and in accordance with their national law.

24. International cooperation is essential for promoting the long-term sustainability of outer space activities. Existing information-sharing mechanisms established by the United Nations treaties and principles on outer space, further supplemented by the present guidelines, provide a basis for collecting and exchanging information, knowledge and experience with respect to the progress being made in the protection of the outer space environment. States are encouraged to provide information on their experiences of implementing these guidelines to the Committee on the Peaceful Uses of Outer Space on a regular basis.

2. Updates

25. The guidelines presented above are based on the substantial body of knowledge that exists for conducting space activities in a safe and sustainable manner. However, the development of the guidelines has also revealed areas for which the current state of scientific and technical knowledge, or the levels of experience gained, are not yet adequate to provide a sound basis for recommending a guideline. Research by States and international intergovernmental organizations on the sustainable use of outer space and on the development of sustainable space technologies, processes and services should continue, as recommended in the guidelines, in order to address those open questions. As the conduct of space activities evolves, which it is doing rapidly, and as more knowledge is gained, the guidelines should be reviewed and revised periodically to ensure that they continue to provide effective guidance to States and to all space actors to promote the long-term sustainability of outer space activities.

III. Proposal for the structuring of the draft guidelines

26. The following table reproduces a proposal for structuring the draft guidelines as they appeared in A/AC.105/C.1/L.340. The proposal was introduced during the fifty-second session of the Scientific and Technical Subcommittee and therefore only reflects those draft guidelines that appeared in document A/AC.105/C.1/L.340.

Topics	*Guidelines*	*Consolidated guidelines*
Regulatory framework for space activities	9 + 12	Adoption of national regulatory frameworks
	10 + 11 + 13 + 22 + 23	Elements to be taken into consideration when developing national regulatory frameworks
	14 + 32 + 33	Supervising national space activities
	4	Spectrum protection
	6	Registration information on space objects
	34	Criteria and procedures for active removal
Scientific and technical research	24 + 26	Data on space objects
	21	Promotion of research on orbital debris and sharing of space debris monitoring information
	28 + 30	Development of space weather models and tools and collection of established practices on the mitigation of space weather effects
	3 + 5	Research on and development of ways to support sustainable exploration and use of outer space
	36	Investigation and consideration of new measures to promote sustainability
Space operations	20	Contact information and information on space objects and orbital events
	27 + 29	Sharing operational space weather data and forecasts
	25	Perform conjunction assessment during orbital phases of controlled flight
	35	Security of foreign space-related ground and information infrastructures
International cooperation, capacity-building and awareness	7 + 8 + 15	Awareness of space activities
	16 + 18	International cooperation in support of the long-term sustainability of outer space activities
	1 + 2	Sharing of experience related to the long-term sustainability of outer space activities and procedures for information exchange
	17 + 19 + 31	Capacity-building

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Vienna, 10-19 June 2015

Draft report

Chapter I

Introduction

1. The Committee on the Peaceful Uses of Outer Space held its fifty-eighth session in Vienna from 10 to 19 June 2015.

2. At its 690th meeting, on 10 June, the Committee elected Rosa Olinda Vasquez Orozco (Ecuador) as First Vice-Chair of the Committee, to replace Diego Stacey Moreno (Ecuador), who had been elected for the office for the period 2014-2015.

3. The officers of the Committee were as follows:

Chair:	Azzedine Oussedik (Algeria)
First Vice-Chair:	Rosa Olinda Vasquez Orozco (Ecuador)
Second Vice-Chair/Rapporteur:	Xinmin Ma (China)

A. Meetings of subsidiary bodies

4. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fifty-second session in Vienna from 2 to 13 February 2015, under the chairmanship of Elöd Both (Hungary). The report of the Subcommittee was before the Committee (A/AC.105/1088).

5. The Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fifty-fourth session in Vienna from 13 to 24 April 2015, under the chairmanship of Kai-Uwe Schrogl (Germany). The report of the Subcommittee was before the Committee (A/AC.105/1090).

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B. Adoption of the agenda

6. At its opening meeting, the Committee adopted the following agenda:

1. Opening of the session.
2. Adoption of the agenda.
3. Statement by the Chair.
4. General exchange of views.
5. Ways and means of maintaining outer space for peaceful purposes.
6. Report of the Scientific and Technical Subcommittee on its fifty-second session.
7. Report of the Legal Subcommittee on its fifty-fourth session.
8. Space and sustainable development.
9. Spin-off benefits of space technology: review of current status.
10. Space and water.
11. Space and climate change.
12. Use of space technology in the United Nations system.
13. Future role of the Committee.
14. Other matters.
15. Report of the Committee to the General Assembly.

C. Membership

7. In accordance with General Assembly resolutions 1472 A (XIV), 1721 E (XVI), 3182 (XXVIII), 32/196 B, 35/16, 49/33, 56/51, 57/116, 59/116, 62/217, 65/97, 66/71, 68/75 and 69/85 and decisions 45/315, 67/412 and 67/528, the Committee on the Peaceful Uses of Outer Space was composed of the following 77 States: Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bolivia (Plurinational State of), Brazil, Bulgaria, Burkina Faso, Cameroon, Canada, Chad, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Ghana, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kazakhstan, Kenya, Lebanon, Libya, Luxembourg, Malaysia, Mexico, Mongolia, Morocco, Netherlands, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Senegal, Sierra Leone, Slovakia, South Africa, Spain, Sudan, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of) and Viet Nam.

D. Attendance

8. Representatives of the following [...] States members of the Committee attended the session: Albania, Algeria, Argentina, Australia, Austria, Belarus, Belgium, Bolivia (Plurinational State of), Brazil, Burkina Faso, Canada, Chile, China, Colombia, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Ghana, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kenya, Lebanon, Luxembourg, Malaysia, Mexico, Mongolia, Morocco, Netherlands, Nicaragua, Nigeria, Pakistan, Peru, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sudan, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Ukraine, United Kingdom, United States, Venezuela (Bolivarian Republic of) and Viet Nam.

9. At its 690th meeting, on 10 June, the Committee decided to invite, at their request, observers for Angola, the Dominican Republic, El Salvador, Israel, Kuwait, Mauritania, Oman, Panama, Qatar, Sri Lanka and the United Arab Emirates, as well as the Holy See, to attend its fifty-eighth session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee concerning status.

10. At its 691st meeting, on 10 June, the Committee decided to invite, at its request, the State of Palestine, to attend its fifty-eighth session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee concerning status.

11. At its 690th meeting, on 10 June, the Committee decided to invite, at the request of the Sovereign Military Order of Malta, the observer for that organization to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee concerning status.

12. At the same meeting, the Committee decided to invite, at the request of the European Union and the League of Arab States, the observers for those organizations to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee concerning status.

13. Observers for the Economic and Social Commission for Asia and the Pacific (ESCAP), the Office for Disarmament Affairs of the Secretariat, the International Civil Aviation Organization (ICAO) and the International Telecommunication Union (ITU) attended the session.

14. The session was attended by observers for the following intergovernmental organizations with permanent observer status with the Committee: Asia-Pacific Space Cooperation Organization (APSCO), European Organization for Astronomical Research in the Southern Hemisphere (ESO), European Space Agency (ESA), European Telecommunications Satellite Organization (EUTELSAT-IGO), Inter-Islamic Network on Space Sciences and Technology (ISNET), International Mobile Satellite Organization (IMSO), International Telecommunications Satellite

Organization (ITSO) and Regional Centre for Remote Sensing of North African States (CRTEAN).

15. The session was also attended by observers for the following non-governmental organizations with permanent observer status with the Committee: European Space Policy Institute (ESPI), International Academy of Astronautics (IAA), International Astronautical Federation (IAF), International Institute for Applied Systems Analysis (IIASA), International Institute of Space Law (IISL), International Society for Photogrammetry and Remote Sensing (ISPRS), Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Secure World Foundation (SWF), Space Generation Advisory Council (SGAC) and World Space Week Association (WSWA).

16. A list of representatives of States members of the Committee, States not members of the Committee, United Nations entities and other organizations attending the session is contained in A/AC.105/2015/INF/1.

E. General statements

17. Statements were made by representatives of the following States members of the Committee during the general exchange of views: Algeria, Argentina, Austria, Brazil, Canada, Chile, China, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Japan, Luxembourg, Mexico, Mongolia, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russian Federation, South Africa, Switzerland, Thailand, Tunisia, United States and Venezuela (Bolivarian Republic of). Statements were also made by the representative of Chile on behalf of the Group of 77 and China and by the representative of Panama on behalf of the Group of Latin American and Caribbean States. A statement was made by the representative of Luxembourg, together with the observer for the European Union, on behalf of the European Union. Statements were also made by the observers for El Salvador, Israel, Oman, Sri Lanka and the United Arab Emirates. The observers for APSCO, CRTEAN, IAA, IAF, ISNET, ESA, ESO, ESPI, EUTELSAT-IGO, SGAC and SWF also made statements.

18. At the 690th meeting, the Chair delivered a statement highlighting the role played by the Committee and its Subcommittees as a unique global platform for enhancing the capacity of States to promote economic, social and cultural development through the use of space tools. He emphasized the need to: (a) foster the active participation in the Committee of each of its member States, from all geographical regions, and promote dialogue with its observer organizations; (b) advance the role of the Committee as the prime intergovernmental global platform for international cooperation in space activities; (c) strengthen the role of the Office for Outer Space Affairs of the Secretariat in providing support for the orderly conduct of space activities; and (d) enhance the interrelationship between the Committee and coordination mechanisms at the regional and interregional levels as a means for the Committee to lead the way towards global space governance for the benefit of all humanity.

19. At the same meeting, the Director of the Office for Outer Space Affairs made a statement in which she reviewed the work carried out by the Office during the previous year, including outreach activities and cooperation and coordination with

United Nations entities and international intergovernmental and non-governmental organizations. She stressed the current unfavourable financial situation of the Office and highlighted the importance of the availability of financial and other resources for the successful implementation of the programme of work of the Office. The situation required addressing its human resources shortfall, and the Director called on Member States to consider supplementing the Office's regular budget with extrabudgetary resources, both in monetary form and in kind. The Director highlighted the role of the Office in discharging the responsibilities of the Secretary-General under the United Nations treaties on outer space and in maintaining the Register on Objects Launched into Outer Space under the obligations set out in the Convention on Registration of Objects Launched into Outer Space. The Register was the Convention's core mechanism for creating transparency and building confidence in outer space activities. She also described the Office's work in coordinating activities among United Nations entities in the areas of sustainable development, global health, emerging issues in commercial space transportation and regulatory aspects of small satellites as examples of the successful implementation of the mandate of the Office to lead the Inter-Agency Meeting on Outer Space Activities (UN-Space).

20. At its 693rd meeting, the Committee invited the Director-General of the United Nations Office at Vienna and Executive Director of the United Nations Office on Drugs and Crime, Yury Fedotov, to make a statement. He highlighted that addressing the challenges to humanity and sustainable development on Earth were closely linked to the Committee's agenda, including protecting the space environment and securing the long-term sustainability of outer space activities, and that the importance attached by the international community to promoting international cooperation on those issues was increasing substantially. The Committee and the Office for Outer Space Affairs played an important role in that regard. The Director-General expressed his commitment to supporting the Director of the Office for Outer Space Affairs in fostering the Committee as a unique global platform. He underscored that the development agenda required effective and innovative tools to support its implementation, including those offered by space science and technology applications.

21. The Committee welcomed Luxembourg as a new member of the Committee on the Peaceful Uses of Outer Space. The African Association of Remote Sensing of the Environment was welcomed as the newest permanent observer to the Committee.

22. The Committee congratulated the United States on the twenty-fifth anniversary of the Hubble Space Telescope mission.

23. The Committee was honoured with the presence of the Soviet cosmonaut Alexey A. Leonov (Russian Federation), who addressed the Committee on the occasion of the fiftieth anniversary of the first spacewalk performed by a human.

24. The Committee noted with satisfaction that 2015 also marked the tenth anniversary of the African Leadership Conference on Space Science and Technology for Sustainable Development, a regional conference to promote intra-African cooperation on the uses of space science and technology to support development in Africa.

25. The Committee also noted with satisfaction the tenth anniversary of the International Committee on Global Navigation Satellite Systems (ICG), and commended the outstanding work of the Office for Outer Space Affairs, which had been serving as the executive secretariat of ICG since its establishment.

26. The Committee noted with appreciation that the Office had developed and launched its new website, which had been designed to better serve the Member States and to raise awareness of the work of the Office, and was a great improvement in terms of the design, navigation and access to information and multimedia additions.

27. The Committee observed a minute of silence to mark the passing in May 2015 of Yuri Kolosov (Russian Federation), who had been a long-standing delegate to the Committee and a dedicated contributor to the development of international space law.

28. The Committee noted with appreciation the holding of the following events on the margins of the session:

(a) Panel discussion on satellites and climate change, organized by France;

(b) "The Hubble Space Telescope, 25 years of cosmic discovery", lecture by Jennifer Wiseman, Senior Scientist for the Hubble Space Telescope, held at the Natural History Museum, Vienna;

(c) Special talk by Sandra Magnus, astronaut from the United States, on the subject of women and girls in science, technology, engineering and mathematics;

(d) Painting exhibition on China's space exploration: "Flying with the wings of art";

(e) ESPI evening event entitled "United States and European geospatial data policies: challenges of open data policy".

29. The Committee heard the following presentations:

(a) "Launching a new United Nations-Japan cooperation programme 'Kibo-CUBE': invitation to CubeSat deployment into orbit from the Japanese Experiment Module (Kibo) of the International Space Station", by the representative of Japan;

(b) "The Hubble Space Telescope: 25 years of cosmic discovery", by the representative of the United States;

(c) "The United States National Academy of Sciences and its space policy and programmatic advisory role", by the representative of the United States;

(d) "Simultaneous observed ionospheric disturbances and abnormal animal behaviour previous to increased seismic activity", by the representative of Brazil;

(e) "Thailand space technology advancement", by the representative of Thailand;

(f) "Lunar Mission One", by the representative of the United Kingdom;

(g) "World space week", by the observer for WSWA; and

(h) "SGAC: next generation perspectives from UNISPACE III to now", by the observer for SGAC.

30. The view was expressed that any launching activities by the Democratic People's Republic of Korea using ballistic missile technology and any activities related to its ballistic missile programme were a flagrant violation of international law, including Security Council resolutions 1718 (2006), 1874 (2009), 2087 (2013) and 2094 (2013). The delegation expressing that view also stated that unlawful acts could not create rights. In that regard, the position by the Secretary-General of the United Nations, in his letter to the President of the Security Council dated 22 February 2013,[1] stating that the act of registration was a technical procedure under the Registration Convention and did not confer legality or legitimacy to the launch of 12 December 2012, was underscored. The delegation expressed the view that it was deplorable that the Democratic People's Republic of Korea had abused the registration function of the United Nations under the Registration Convention to attempt to legitimize its ballistic missile-related programme as a peaceful space activity, including by notifying its national point of contact, the National Aerospace Development Administration, which was an alias of the Korean Committee for Space Technology, an entity listed in the sanctions list of the Security Council Committee established pursuant to resolution 1718 (2006).

31. The view was expressed that negotiations carried out thus far on the draft international code of conduct for outer space activities proposed by the European Union had been unproductive and even detrimental to the work of the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee. The delegation expressing that view also considered that normative regulations impacting the wide range of issues relating to the safety of space operations should be handled through established practices within the Committee on the Peaceful Uses of Outer Space and its Subcommittees.

32. The view was expressed that the draft international code of conduct promoted concepts that contradicted basic norms of international law, such as unauthorized supra-jurisdictional actions against foreign space objects based on indefinite motives. The process of consultations on the draft code had not proved to be successful, owing to a corporate style of behaviour on the part of the authors and co-sponsors of the document, who had demonstrated their reluctance to act in a way motivated by partnership and responsible management of the process of consultations and to take observations of invited participants into consideration and illuminate their concerns. The delegation expressing those views also considered that, before advancing a position on the right to self-defence in any international regulatory instrument, it would be important to achieve a shared understanding within the framework of the Committee concerning the legal basis and modalities for exercising such a right, as applied to outer space, and that a separate adoption of the draft international code of conduct, with its emphasis on matters related to conflicts in outer space, would mean reformatting space policy and setting a long-term negative trend in regulating the safety and security of space activities.

33. The view was expressed that the process of negotiating the draft international code of conduct should be continued in an inclusive and transparent manner in order to allow as wide a membership as possible. The delegation expressing that view

[1] S/2013/108.

considered that the draft international code of conduct should cover all space activities, civil and military, and that links should be established between the space and disarmament communities, in order to overcome the challenges that were faced by both of those communities and that threatened the safety and security of space activities.

F. Adoption of the report of the Committee

34. After considering the various items before it, the Committee, at its [...] meeting, on [...] June 2015, adopted its report to the General Assembly containing the recommendations and decisions set out below.

Chapter II

Recommendations and decisions

A. Ways and means of maintaining outer space for peaceful purposes

35. In accordance with paragraph 14 of General Assembly resolution 69/85, the Committee continued its consideration, as a matter of priority, of ways and means of maintaining outer space for peaceful purposes, including consideration of ways to promote regional and interregional cooperation and the role that space technology could play in the implementation of recommendations of the United Nations Conference on Sustainable Development.

36. In accordance with paragraph 15 of the same resolution, the Committee considered the broader perspective of space security and associated matters that would be instrumental in ensuring the safe and responsible conduct of space activities, as well as the recommendations contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, with a view to identifying those recommendations that could, to the extent practicable, be adapted to and instrumental in ensuring the safety of space operations and the long-term sustainability of outer space activities in general.

37. The representatives of Brazil, Colombia, Indonesia, Japan, the Republic of Korea, the Russian Federation, Switzerland, the United States and Venezuela (Bolivarian Republic of) made statements under the item. During the general exchange of views, statements relating to the item were also made by other member States, the representative of Chile on behalf of the Group of 77 and China and the representative of Panama on behalf of the Group of Latin American and Caribbean States.

38. The Committee heard the following presentations under the item:

(a) "The Italian contribution to space exploration", by the representative of Italy;

(b) "Space Security Index", by the representative of Canada.

39. The Committee had before it the following:

(a) Note by the Secretariat entitled "Recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities: views of States members of the Committee on the Peaceful Uses of Outer Space" (A/AC.105/1080 and Add.1 and 2);

(b) Working paper submitted by the Russian Federation entitled "Achievement of a uniform interpretation of the right of self-defence in conformity with the Charter of the United Nations as applied to outer space as a factor in maintaining outer space as a safe and conflict-free environment and promoting the long-term sustainability of outer space activities" (A/AC.105/L.294).

40. The view was expressed that the Committee should begin to consider the legal basis for, and the modalities of, in a hypothetical case, the exercise of the right to self-defence in accordance with the Charter of the United Nations, as applied to outer space; that Articles 2 and 51 of the Charter of the United Nations should be thoroughly analysed and interpreted in relation to outer space activities, with its complex system of maintenance of security and where potential conflicts of interest could lead to the emergence of extreme situations; and that such work, logically associated with the responsible conduct of space activities, would help States to reach an understanding and partnership with regard to establishing and sustaining a highly adaptive regulatory system that would adequately alleviate or avoid situations and problems that might cause conflicts in outer space.

41. The view was expressed that consideration by the Committee of the well-defined questions contained in document A/AC.105/L.294 would assist in better understanding the actions to be taken in reaction to conflict situations (or conflicts of interests) in outer space, which would be important in view of the tendency of space regulation operations — as seen in the national documents of some States — to respond to such conflicts with immediate actions, rather than through consultation mechanisms. The concept of pre-emptive defence in outer space, as defined in some national strategies, was not supported by the provisions of the Charter of the United Nations. The delegation expressing that view was also of the view that a common understanding and position on the matters of the right of self-defence in outer space, if achieved in the Committee, could be presented to the General Assembly and Security Council.

42. Some delegations reaffirmed the commitment of their countries to the peaceful use and exploration of outer space and emphasized the following principles: universal and equal access to outer space for all countries without discrimination, regardless of their level of scientific, technical and economic development, as well as the equitable and rational use of outer space for the benefit of all humankind; non-appropriation of outer space, including the Moon and other celestial bodies, by claim of sovereignty, use, occupation or any other means; non-militarization of outer space, which should never be used for the installation of weapons of any kind, and, as a common heritage of humankind, its strict use for the improvement of living conditions and peace among the peoples inhabiting our planet; international responsibility of States for their national space activities; and regional cooperation to promote space activities, as established by the General Assembly and other international forums.

43. Some delegations expressed the view that it was necessary to ensure the safe and responsible conduct of space activities and to identify effective tools that could potentially provide the Committee with new guidance, in a pragmatic manner and without prejudice to the mandates of other intergovernmental forums, through the development and implementation of transparency and confidence-building measures.

44. The view was expressed that the increase in the number of objects in Earth orbit, the diversification of assets and actors in space, the development of new capabilities and the increasing risk of collisions with space debris, including risks arising from a possible use of force in space, posed new challenges to the peaceful uses of outer space.

45. Some delegations expressed the view that the existing legal regime with respect to outer space was not adequate to prevent the placement of weapons in outer space or to address issues concerning the space environment, and that it was important to further develop international space law in order to maintain outer space for peaceful purposes. Those delegations were of the view that, in order to ensure that outer space was used peacefully and to prevent its militarization, the preparation of binding international legal instruments was necessary.

46. Some delegations expressed the view that, in order to maintain the peaceful nature of space activities and prevent the placement of weapons in outer space, it was essential for the Committee to enhance its cooperation and coordination with other bodies and mechanisms of the United Nations system, such as the First Committee of the General Assembly and the Conference on Disarmament.

47. The view was expressed that the Committee had been created exclusively to promote international cooperation with respect to the peaceful uses of outer space and that disarmament issues were more appropriately dealt with in other forums, such as the First Committee and the Conference on Disarmament. The delegation expressing that view was also of the view that no actions by the Committee were needed regarding the weaponization of outer space and that there was no scarcity of appropriate multilateral mechanisms under which disarmament could be discussed.

48. The Committee noted with satisfaction the adoption by the General Assembly of its resolution 68/50 on 5 December 2013 and took note of the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189) and the note by the Secretariat containing views of States members of the Committee on the recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/AC.105/1080 and Add.1 and 2).

49. The view was expressed that the achievement by the 2014 ITU Plenipotentiary Conference of consensus on a resolution on strengthening the role of ITU with regard to transparency and confidence-building measures in outer space activities was a result of the successful implementation of the recommendations of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities.

50. The view was expressed that the Committee could have a role in reviewing the implementation of specific unilateral, bilateral, regional and multilateral

transparency and confidence-building measures in outer space, as well as in discussing new ones.

51. The Committee noted with satisfaction continuous developments in a number of cooperative endeavours that were being pursued at the international, regional and interregional levels by various actors, such as States and international intergovernmental and non-governmental organizations, and emphasized that such cooperation was essential for strengthening the peaceful uses of outer space and for assisting States in the development of their space capabilities. In that regard, the Committee noted the important role that bilateral and multilateral agreements played in promoting common space exploration objectives and cooperative and complementary space exploration missions.

52. Some delegations expressed the view that the United Nations was essential for strengthening and developing cooperation and collaboration among countries, in particular on scientific and space technology, and for maximizing space resources for common prosperity, security and the sustainability of outer space. The delegations expressing that view were also of the view that solid cooperation should enhance information-sharing and technical cooperation among countries in line with the principles of friendship, equal partnership and mutual respect.

53. The Committee noted with appreciation that the sixth African Leadership Conference on Space Science and Technology for Sustainable Development would be hosted by Egypt and would be held in Cairo in December 2015.

54. The Committee recalled the Pachuca Declaration, adopted by the Sixth Space Conference of the Americas, held in Pachuca, Mexico, from 15 to 19 November 2010, which had developed a regional space policy for the near future and also, inter alia, created an advisory group of space experts. The Committee noted that the pro tempore secretariat of the Sixth Space Conference of the Americas was continuing the implementation of the Pachuca Declaration. The Committee also noted that the Government of the Bolivarian Republic of Venezuela had expressed its willingness to host the next Space Conference of the Americas.

55. The Committee noted with satisfaction that the twenty-first session of the Asia-Pacific Regional Space Agency Forum had been successfully held from 2 to 5 December 2014 in Tokyo under the theme "Leap to the next stage: delivering innovative ideas and solutions". The Committee also noted that the twenty-second session would be held in Bali, Indonesia, from 1 to 4 December 2015, under the theme "Sharing solutions through synergy in space".

56. The Committee noted with satisfaction that the eighth meeting of the Council of APSCO had been held in Lahore, Pakistan, on 24 and 25 September 2014, at which the Council had approved a number of new projects, reviewed the progress being made on those approved earlier and agreed to hold its next meeting in 2015.

57. Some delegations expressed the view that the Committee played a notable role in advancing space cooperation and provided a unique forum for the exchange of information among States, and that there were tangible opportunities to enhance international cooperation, in keeping with the Committee's mandate.

58. The Committee agreed that, through its work in the scientific, technical and legal fields, as well as through the promotion of international dialogue and exchange of information on various topics relating to the exploration and use of

outer space, it had a fundamental role to play in enhancing transparency and confidence-building among States, as well as in ensuring that outer space was maintained for peaceful purposes.

59. The Committee recommended that at its fifty-ninth session, in 2016, consideration of the item on ways and means of maintaining outer space for peaceful purposes should be continued, on a priority basis.

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Draft report

Chapter II

Recommendations and decisions

B. Report of the Scientific and Technical Subcommittee on its fifty-second session

1. The Committee took note with appreciation of the report of the Scientific and Technical Subcommittee on its fifty-second session (A/AC.105/1088), which contained the results of its deliberations on the items considered by the Subcommittee in accordance with General Assembly resolution 69/85.

2. The Committee expressed its appreciation to Előd Both (Hungary) for his able leadership during the fifty-second session of the Subcommittee.

3. The representatives of Austria, Algeria, Canada, Chile, China, the Czech Republic, Egypt, Germany, India, Iran (Islamic Republic of), Japan, Mexico, Pakistan, the Republic of Korea, the Russian Federation, Saudi Arabia, the Syrian Arab Republic, Turkey, Venezuela (Bolivarian Republic of) and the United States made statements under the item. Statements were also made by the representative of Chile on behalf of the Group of Latin American and Caribbean States and on behalf of the Group of 77 and China. During the general exchange of views, statements relating to the item were also made by other member States.

4. The Committee heard the following presentations:

(a) "Japan's human space activity 30-year history", by the representative of Japan;

(b) "Operation and development of the BeiDou Navigation Satellite System", by the representative of China;

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(c) "The Italian scientific contribution to the BepiColombo mission", by the representative of Italy;

(d) "A preliminary suggestion for international cooperation on the Chang'e-4 lunar probe", by the representative of China.

1. United Nations Programme on Space Applications

(a) Activities of the United Nations Programme on Space Applications

5. The Committee took note of the discussion of the Subcommittee under the item on the United Nations Programme on Space Applications, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 31-52).

6. The Committee noted that the priority areas of the Programme were environmental monitoring, natural resource management, satellite communications for tele-education and telemedicine applications, disaster risk reduction, the use of global navigation satellite systems (GNSS), the Basic Space Science Initiative, space law, climate change, the Basic Space Technology Initiative and the Human Space Technology Initiative. The Committee also noted that the new thematic priority of monitoring and protecting biodiversity and ecosystems was included in the Programme for 2015.

7. The Committee took note of the activities of the Programme carried out in 2014, as presented in the report of the Subcommittee (A/AC.105/1088, paras. 41-44) and in the report of the Expert on Space Applications (A/AC.105/1085, annex I).

8. The Committee expressed its appreciation to the Office for Outer Space Affairs for the manner in which the activities of the Programme had been implemented. The Committee also expressed its appreciation to the Governments and intergovernmental and non-governmental organizations that had sponsored the activities.

9. The Committee noted with satisfaction that progress was being made in the implementation of the activities of the Programme for 2015, as described in the report of the Subcommittee (A/AC.105/1088, para. 45).

10. The Committee also noted with satisfaction that the Office for Outer Space Affairs was helping developing countries and countries with economies in transition to participate in and benefit from activities being carried out under the Programme.

11. The Committee noted with concern the limited financial resources available to implement the Programme and appealed to States and organizations to continue supporting the Programme through voluntary contributions.

12. The Committee noted that additional human resources were necessary to fully implement the range of activities to be conducted by the Programme and that without those additional resources, the Office would not be in a position to meet the increasing demands by Member States with respect to the sustainable development goals and the post-2015 development agenda.

13. The Committee took note of the conference room papers entitled "Space technologies for monitoring and protecting biodiversity and ecosystems: a proposed new thematic priority for the United Nations Programme on Space Applications"

(A/AC.105/2015/CRP.10); "Basic Space Technology Initiative: activities in 2014-2015 and plans for 2016 and beyond" (A/AC.105/2015/CRP.11); and "Report on the United Nations/Japan Workshop on Space Weather 'Science and data products for ISWI instruments'" (A/AC.105/2015/CRP.12).

(i) Conferences, training courses and workshops of the United Nations Programme on Space Applications

14. The Committee endorsed the workshops, training courses, symposiums and expert meetings planned for the remainder of 2015 and expressed its appreciation to Austria, Costa Rica, Japan, Kenya, the Russian Federation, South Africa and the United Arab Emirates, as well as to IAF, for co-sponsoring and hosting those activities (see A/AC.105/1085, annex II).

15. The Committee noted that the Islamic Republic of Iran had proposed to postpone the United Nations/Islamic Republic of Iran Workshop on the Use of Space Technology for Dust Storm and Drought Monitoring in the Middle East Region, scheduled to be held in Tehran in September 2015.

16. The Committee endorsed the programme of workshops, training courses, symposiums and expert meetings relating to environmental monitoring, natural resource management, global health, GNSS, basic space science, basic space technology, climate change, human space technology and the socioeconomic benefits of space activities to be held in 2016 for the benefit of developing countries.

(ii) Long-term fellowships for in-depth training

17. The Committee expressed its appreciation to the Government of Italy, which, through the Politecnico di Torino and the Istituto Superiore Mario Boella and with the collaboration of the Istituto Elettrotecnico Nazionale Galileo Ferraris, had continued to provide fellowships for postgraduate studies on GNSS and related applications.

18. The Committee expressed its appreciation to the Government of Japan for continuing the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies, in cooperation with the Kyushu Institute of Technology.

19. The Committee expressed its appreciation to the Government of Germany, which, in collaboration with the Centre of Applied Space Technology and Microgravity and the German Aerospace Center (DLR), had successfully conducted the first cycle of its drop tower experiments.

20. The Committee welcomed the cooperation programme between the Office for Outer Space Affairs and the Japan Aerospace Exploration Agency (JAXA) on offering entities located in States Members of the United Nations an opportunity to deploy a small satellite of their design and construction from the Japanese Experiment Module (Kibo) of the International Space Station, in order to promote international cooperation and capacity-building in space technology and its applications under the United Nations Programme on Space Applications. The undertaking of similar joint projects by the Office and other space agencies was encouraged.

21. The Committee noted that it was important to increase opportunities for capacity-building and in-depth education in all areas of space science, technology, applications and law through cooperative projects and long-term fellowship programmes, including by the Office, and urged Member States to make such opportunities available at their relevant institutions.

(iii) Technical advisory services

22. The Committee noted with appreciation the technical advisory services provided under the United Nations Programme on Space Applications in support of activities and projects promoting regional cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/1085, paras. 39-48).

(iv) Regional centres for space science and technology education, affiliated to the United Nations

23. The Committee noted with satisfaction that the United Nations Programme on Space Applications continued to emphasize, promote and foster cooperation with Member States at the regional and global levels to support the regional centres for space science and technology education, affiliated to the United Nations. The highlights of the activities of the regional centres supported under the Programme in 2013-2015 were presented in the report of the Expert on Space Applications (A/AC.105/1085, annex III).

24. The Committee noted with appreciation that the host countries of the regional centres for space science and technology education, affiliated to the United Nations, in line with their obligations as host countries, were continuing to provide the centres with financial and in-kind support.

25. The Committee noted with concern the limited financial resources available to some of the regional centres and appealed to Member States and organizations in the regions where those centres were located to support the activities of the centres through financial and in-kind contributions.

26. The Committee welcomed the inauguration of the new Regional Centre for Space Science and Technology Education for Asia and the Pacific, located at Beihang University in Beijing, and noted with appreciation the commitment of the Government of China to supporting the work of the centre.

27. The Committee noted that the Regional Centre had completed the selection of 42 overseas students for the first long-term scholarship programme and that those students would start their studies in September 2015. In April 2015, the regional centre had organized a short-term training programme on satellite navigation and its applications. Two other short-term training programmes, on remote sensing and on space law and policy, were to be held in the second half of 2015.

(b) International Satellite System for Search and Rescue

28. The Committee noted with satisfaction that the International Satellite System for Search and Rescue (COSPAS-SARSAT) currently had 41 member States and two participating organizations and that there was additional interest in being associated with the programme. The Committee noted with appreciation that the

worldwide coverage for emergency beacons had been made possible by the space segment, which consisted of six polar-orbiting and six geostationary satellites provided by Canada, France, India, the Russian Federation and the United States, along with the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), as well as by the ground-segment contributions made by 26 other countries. The Committee noted that, since becoming operational in 1982, COSPAS-SARSAT had provided assistance in rescuing nearly 40,000 persons in more than 11,000 search and rescue events and that in 2014, alert data from the system had helped to save more than 2,100 lives in over 700 search and rescue events worldwide.

29. The Committee noted that the use of satellites in medium-Earth orbit continued to be explored, with a view to improving international satellite-aided search and rescue operations.

2. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda

30. The Committee took note of the discussion of the Subcommittee under the item on space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 53-69).

31. The Committee endorsed the recommendations and decisions on the item made by the Subcommittee and its Working Group of the Whole (A/AC.105/1088, para. 69, and annex I, paras. 4 and 7).

32. The Committee recalled that the General Assembly, in its resolution 69/85, had reiterated the need to promote the benefits of space technology and its applications in the major United Nations conferences and summits for economic, social and cultural development and related fields, and had recognized that the fundamental significance of space science and technology and their applications for global, regional, national and local sustainable development processes should be promoted in the formulation of policies and programmes of action and their implementation, including through efforts towards achieving the objectives of those conferences and summits, including implementing the United Nations Millennium Declaration and contributing to the post-2015 development agenda process.

33. The Committee endorsed the mandate and workplan of the expert group on space and global health (A/AC.105/1088, annex I, para. 7).

3. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment

34. The Committee noted the discussion of the Subcommittee under the item on matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 70-84).

35. The Committee also noted a number of regional and international initiatives aimed at strengthening the use of remote sensing data to further socioeconomic and sustainable development, in particular for the benefit of developing countries.

36. In the course of the discussion, delegations reviewed national and cooperative programmes on using remote sensing data. A number of areas where remote sensing data continued to be crucial for well-informed decision-making were singled out. Examples included climate change monitoring, disaster management, management of natural resources, illicit crop monitoring, drought and desertification forecasting, oceanography, rural development, agriculture, urban planning, food security, public health and humanitarian and development aid, in particular monitoring populations and natural resources in camps for refugees and internally displaced persons.

37. In view of the increasing importance of remote sensing technology and other space science and technology applications, some delegations called for increased capacity-building in those areas to enable relevant national actors, in particular in developing countries, to use remote sensing technology when taking preventive measures against environmental degradation and related hazards. Those delegations also expressed their support for initiatives that promoted the availability and distribution of space-based data to developing countries at no cost.

38. The Committee noted the important role played by regional organizations and coordination mechanisms in promoting regional cooperation in the use of remote sensing technology, such as APSCO, APRSAF and its Sentinel Asia project, as well as initiatives undertaken by ESCAP on drought monitoring and disaster management.

39. The Committee also noted the number of launches of Earth observation satellites and a number of cooperative initiatives by developing countries to launch such satellites, and stressed the need to continue enhancing the capacities of developing countries with regard to the use of remote sensing technology.

4. Space debris

40. The Committee took note of the discussion of the Subcommittee under the item on space debris, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 85-113).

41. The Committee endorsed the decisions and recommendations of the Subcommittee on the item (A/AC.105/1088, paras. 90 and 113).

42. The Committee noted with appreciation that some States were already implementing space debris mitigation measures, consistent with the Space Debris Mitigation Guidelines of the Committee and/or the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines, and that other States had developed their own space debris mitigation standards based on those guidelines. The Committee also noted that other States were using the IADC Guidelines and the European Code of Conduct for Space Debris Mitigation as reference points in their regulatory frameworks for national space activities. The Committee further noted that other States had cooperated, in the framework of the ESA space situational awareness programme, to address the issue of space debris.

43. The Committee urged those countries that had not yet done so to consider voluntary implementation of the Space Debris Mitigation Guidelines of the Committee and/or the IADC Space Debris Mitigation Guidelines.

44. The Committee noted with appreciation the establishment of the Space Debris Observation and Operation Centre by the China National Space Administration on 8 June 2015, and the China-Brazil Joint Laboratory for Space Weather on 6 August 2014, which would contribute to international cooperation in space debris and space weather.

45. Some delegations expressed the view that the future of space activities largely depended on space debris mitigation and removal, and that the issue of mitigation of space debris should continue to be treated as a priority, with a view to further increasing research in the areas of technology for space debris observation, space debris environmental modelling and technologies to protect space systems from space debris and to limit the creation of additional space debris.

46. Some delegations expressed the view that it was necessary to continue the thorough consideration of the issue of space debris mitigation, in particular by paying greater attention to the problem of debris coming from platforms with nuclear power sources in outer space and to collisions of space objects with space debris and their derivatives, as well as to ways of improving the technology for monitoring space debris.

47. Some delegations expressed the view that States, especially those that were largely responsible for the situation with regard to space debris, and those that had the ability to take action for space debris mitigation, should disseminate information on actions taken to reduce the generation of space debris.

48. The view was expressed that the Space Debris Mitigation Guidelines of the Committee had proved to be an important mechanism for international cooperation to address major opportunities and challenges in the peaceful use and exploration of outer space.

49. The view was expressed that the investigation and consideration of new measures to manage space debris in the long term were indispensable to ensuring the long-term sustainability of outer space activities.

50. The view was expressed that it was important to address the issue of the proliferation of space debris without hampering the development of the capabilities of emerging spacefaring nations.

51. The view was expressed that the issue of active space debris removal could become a new item on the agenda of the Subcommittee.

52. The view was expressed that space debris mitigation measures were possible even for small and very small satellites.

53. The view was expressed that, given the significant risks associated with the proliferation of space debris threatening the integrity of satellites, the International Space Station and the men and women on board the International Space Station, the issue of space debris mitigation should continue to receive the attention of the Committee.

54. The view was expressed that spacefaring countries should assist countries with emerging space programmes in building capacities with regard to the implementation of space debris mitigation measures, including by providing training and transfer of relevant technology, and without imposing undue costs on the space programmes of the developing nations.

5. Space-system-based disaster management support

55. The Committee took note of the discussion of the Subcommittee under the item on space-system-based disaster management support, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 114-132).

56. The Committee had before it a proposed workplan for the biennium 2016-2017 of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), contained in document A/AC.105/1093. The Committee also had before it conference room papers entitled "United Nations/Germany International Conference on Earth Observation: global solutions for the challenges of sustainable development in societies at risk" (A/AC.105/2015/CRP.9) and "Space-based information and the Sendai Framework for Disaster Risk Reduction" (A/AC.105/2015/CRP.16).

57. At the 690th meeting of the Committee, the Director of the Office for Outer Space Affairs, in her statement to the Committee, thanked the Governments of Austria, China and Germany for their commitment to the UN-SPIDER programme and the support they had given it since its inception. She invited interested Member States to consider providing necessary resources as voluntary contributions and/or as concrete offers for collaboration and partnership, in order to enable the UN-SPIDER programme to respond to the growing demand for support in disaster risk reduction and emergency response. The Director also underlined the significant role of the UN-SPIDER knowledge portal (www.un-spider.org) in assisting Member States in emergency situations, including during the recent earthquakes in Bangladesh, China, India and Nepal.

58. The Committee noted that natural disasters continued to be a matter of great concern to all countries and that increased efforts should therefore be vested in strengthening the use of space-based technology for disaster risk reduction.

59. The Committee welcomed the adoption in March 2015 of the Sendai Framework for Disaster Risk Reduction 2015-2030, in which the value of space-based technology and Earth observation for disaster management and emergency response, paving the way for building more resilient societies through effective disaster risk management, was recognized. The Committee noted that the efforts conducted by the Office for Outer Space Affairs and its UN-SPIDER programme, as detailed in A/AC.105/2015/CRP.16, had resulted in the final text of the Sendai Framework making specific references to the importance of using information gathered by space-based platforms and in situ to understand the risks connected with disasters of natural causes worldwide. The efforts of the Office and its UN-SPIDER programme had included the promotion of international cooperation as a way to enhance the use of space-based technologies and related services at the national and local levels.

60. It was noted that, during the Third World Conference on Disaster Risk Reduction, held in Sendai, Japan, the Global Earth Observation Partnership was

launched as a voluntary effort by the Office for Outer Space Affairs, its UN-SPIDER programme and 17 other partners to facilitate the use of Earth observation and space-based technologies to contribute to the achievement of the main goal and the seven targets stipulated in the Sendai Framework.

61. The Committee noted with satisfaction that a joint United Nations/Germany international conference on Earth observation had been held in Bonn, Germany, from 26 to 28 May to discuss global solutions for the challenges of sustainable development in societies at risk. It had been co-organized with DLR and the German Federal Ministry for Economic Affairs and Energy to discuss ways and means of institutionalizing the use of space-based information in national plans and regional and global platforms, and to review international space cooperation mechanisms aimed at fostering national implementation of the Sendai Framework.

62. The Committee noted with satisfaction that the fifth annual conference organized by the UN-SPIDER Beijing office would be held from 14 to 16 September in Beijing, focusing on the implementation of the Sendai Framework.

63. The Committee noted with appreciation the information and services provided by the UN-SPIDER programme, such as the technical advisory missions, as a valuable contribution to strengthening disaster risk preparedness and emergency response at the national level.

64. Some delegations called on the Office for Outer Space Affairs and its UN-SPIDER programme to intensify their capacity-building activities through training programmes, in particular in developing countries.

65. The Committee noted the valuable contribution that Member States were making with their ongoing activities to increase the availability and use of space-based solutions in support of disaster management, including the Sentinel Asia project and its coordination of emergency observation requests through the Asian Disaster Reduction Centre, the emergency mapping service of the European Earth Observation Programme (Copernicus) and the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters). The Committee noted the need to strengthen disaster risk reduction efforts by using services of the UN-SPIDER programme and other disaster relief platforms to enable more countries to benefit from disaster risk reduction efforts.

66. The Committee also noted the valuable contribution that the Global Earth Observation Partnership could make in the coming years as a vehicle for enhancing the use by developing countries of space-based and in situ information to reduce both their exposure to hazards and their vulnerability.

67. The Committee noted the capacity-building efforts made by regional centres affiliated to the United Nations, in particular the Regional Centre for Space Science and Technology Education for Asia and the Pacific, by conducting courses on disaster risk reduction and emergency response.

6. Recent developments in global navigation satellite systems

68. The Committee took note of the discussion of the Subcommittee under the item on recent developments in GNSS, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 133-155).

69. The Committee noted that 2015 marked the tenth anniversary of the establishment of ICG under the auspices of the United Nations. It was highlighted that ICG had been highly successful in bringing together the providers and users of GNSS to promote its use and integration into national infrastructure, particularly in developing countries.

70. The Committee expressed its appreciation to the Office for Outer Space Affairs for its continued support as executive secretariat for ICG and its Providers' Forum and for the organization of workshops and training courses focusing on capacity-building in the use of GNSS-related technologies in various fields of science and industry, including on the subject of space weather effects in the ionosphere and their impact on positioning.

71. The Committee noted with appreciation that the ninth meeting of ICG and the thirteenth meeting of its Providers' Forum, organized by the European Commission and the European GNSS Agency on behalf of the European Union, had been held in Prague from 10 to 14 November 2014. The Committee noted that the tenth meeting of ICG would be organized by the United States and held in Boulder, Colorado, United States, from 1 to 6 November 2015. The Committee also noted the expression of interest by the Russian Federation in hosting the eleventh meeting of ICG in 2016.

72. The Committee noted with appreciation the financial contributions made by the United States and the European Commission to the Office for Outer Space Affairs in support of GNSS-related activities, ICG and the ICG Providers' Forum.

73. The Committee noted that regular meetings among China, India, Japan, the Russian Federation, the United States and the European Union had been held to discuss ways in which interoperability among GNSS providers could be enhanced and services for the global user community could be improved.

7. Space weather

74. The Committee took note of the discussion of the Subcommittee under the item on space weather, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 156-169).

75. The Committee welcomed the establishment of the Expert Group on Space Weather of the Subcommittee, which met for the first time on the margins of the fifty-second session of the Subcommittee, under the leadership of Canada, to define its programme of work, drawing on the best practices of the work of expert group C on space weather of the Working Group on the Long-term Sustainability of Outer Space Activities.

76. The Committee endorsed the mandate of the Expert Group, as contained in paragraph 169 of the report of the Subcommittee (A/AC.105/1088), which was to promote awareness, provide guidance and enable communication and cooperation in space weather-related activities among States members of the Committee and related national and international organizations.

77. The Committee noted that the work of the Expert Group could contribute to the Inter-programme Coordination Team on Space Weather, coordinated by the World Meteorological Organization, and to the creation of the space weather road map, initiated by the Committee on Space Research (COSPAR).

78. The Committee also noted that a number of national space weather strategies were being developed, such as the national space weather strategy of the United States, which aimed at enhancing national preparedness for severe space weather events and attached great importance to promoting the international coordination of the exchange of data and services related to space weather.

79. The Committee further noted that a number of events were being held that were aimed at identifying areas of cooperation among member States and national and international organizations to improve national capabilities and enhance global efforts related to space weather, including the United Nations/Japan Workshop on Space Weather held in Fukuoka, Japan, from 2 to 6 March; the workshop entitled "Space weather services to build global resilience", led by the National Oceanic and Atmospheric Administration of the United States, held on the margins of the fifty-second session of the Scientific and Technical Subcommittee; and the planned half-day symposium of the COSPAR/International Living with a Star programme, to be held during the fifty-third session of the Scientific and Technical Subcommittee, in 2016.

80. The Committee noted that the International Centre for Space Weather Science and Education (ICSWSE), based at Kyushu University (Japan), continued its support for space weather research, including the operation of a Magnetic Data Acquisition System (MAGDAS) global network of magnetometers, and space weather education, including the implementation of schools for building capacity in connection with MAGDAS. It also noted that the ISWI newsletter continued to be published by ICSWSE.

8. Near-Earth objects

81. The Committee took note of the discussion of the Subcommittee under the item on near-Earth objects, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 170-191).

82. The Committee recalled that effective responses for the mitigation of hazard threats from near-Earth objects were best addressed through international cooperation in observation, characterization, information-sharing and capacity-building, and in the advancement of technologies for the collection of data on near-Earth objects and the development of near-Earth object observation spacecraft.

83. The Committee noted with satisfaction the ongoing work by the International Asteroid Warning Network (IAWN) and of the Space Mission Planning Advisory Group (SMPAG), established as a result of the recommendations for an international response to the near-Earth object impact threat, recalled by the General Assembly in its resolution 69/85.

84. The Committee noted that the steering committee of IAWN had held a meeting on 11 November 2014 in conjunction with the forty-sixth annual meeting of the Division of Planetary Sciences of the American Astronomical Society. The steering committee heard presentations about the current capabilities and activities of multiple near-Earth object characterization projects. A final draft of the letter of intent for participation in IAWN was presented and discussed. Further information can be found at www.minorplanetcenter.net/IAWN.

85. The Committee noted that the third meeting of SMPAG had taken place at the European Space Research Institute of ESA in Frascati, Italy, on 9 and 10 April 2015. The main focus had been the discussion of the SMPAG workplan. All task leaders had presented the status of their work items and it had been agreed that semi-annual reports on ongoing tasks would be provided by the task leaders.

86. The Committee was informed that the next SMPAG steering committee meeting was to be held on the margins of the meeting of the Division for Planetary Sciences of the American Astronomical Society in National Harbor, Maryland, United States, from 8 to 13 November 2015. Task leaders had been invited to participate, further information could be found on the official SMPAG website.

87. The view was expressed that the technical work of IAWN and SMPAG would have to be complemented by high-level political decision-making mechanisms so that measures to counter an emerging threat could be implemented in a timely and effective manner.

88 The Committee noted that the Action Team on Near-Earth Objects had successfully established IAWN and SMPAG and that the Subcommittee had recommended that it be dissolved.

89. The Committee noted with appreciation the work of the Action Team and commended its achievements in coordinating international efforts to mitigate the hazard threat from near-Earth objects, in particular by establishing IAWN and SMPAG. The Committee also thanked the Chair of the Action Team, Sergio Camacho (Mexico), for his dedicated work.

9. Use of nuclear power sources in outer space

90. The Committee took note of the discussion of the Subcommittee under the item on the use of nuclear power sources in outer space, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 192-208).

91. The Committee endorsed the report of the Subcommittee and the Working Group on the Use of Nuclear Power Sources in Outer Space, reconvened under the chairmanship of Sam A. Harbison (United Kingdom) (A/AC.105/1088, para. 208, and annex II).

92. The Committee encouraged States and international intergovernmental organizations to begin or to continue implementing the Safety Framework for Nuclear Power Source Applications in Outer Space (A/AC.105/934).

93. Some delegations expressed the view that the Safety Framework, in its present form, was not adequate to meet the challenges posed by the use of nuclear power sources in outer space and that the proliferation of such power sources in outer space, including in terrestrial orbits, should not be allowed, as their effects on humankind and the environment had not been assessed and there was no definite framework establishing responsibilities and introducing technical and legal tools that could effectively address the critical situations that might arise because of improper practices.

94. Some delegations expressed the view that Governments bore international responsibility for national activities involving the use of nuclear power sources in

outer space conducted by governmental and non-governmental organizations and that the matter concerned all humanity.

95. Some delegations expressed the view that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to develop binding legal instruments to define the responsibilities of States in the use of nuclear power sources in outer space and to undertake research on ways and means of optimizing or substituting for the use of nuclear energy in outer space activities.

96. Some delegations expressed the view that more consideration should be given to the use of nuclear power sources in terrestrial orbits in order to address the problem of potential collisions of nuclear power source objects, as well as to their accidental re-entry into the Earth's atmosphere. Those delegations were of the view that more attention should be given to the matter through adequate strategies, long-term planning, regulations and the promotion of binding standards, as well as the Safety Framework for Nuclear Power Source Applications in Outer Space.

10. Long-term sustainability of outer space activities

97. The Committee took note of the discussion of the Subcommittee under the item on the long-term sustainability of outer space activities, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 209-259).

98. The Committee endorsed the recommendations and decisions on the item made by the Subcommittee and the Working Group on the Long-term Sustainability of Outer Space Activities, reconvened under the chairmanship of Peter Martinez (South Africa) (A/AC.105/1088, para. 259, and annex III, paras. 14 and 15).

99. The Committee had before it the following:

(a) Note by the Secretariat on an updated set of draft guidelines for the long-term sustainability of outer space activities (A/AC.105/L.298);

(b) Draft report of the Working Group on the Long-term Sustainability of Outer Space Activities: working paper by the Chair of the Working Group (A/AC.105/C.1/L.343), which had previously been made available to the Subcommittee at its fifty-second session;

(c) Working paper submitted by the Russian Federation entitled "Proposal on the review and consideration of the concept of a United Nations information platform serving common needs in collecting and sharing information on near-Earth space monitoring in the interests of the safety of space operations, and its architectural and programmatic aspects" (A/AC.105/L.293), which had previously been made available to the Subcommittee at its fifty-second session;

(d) Working paper submitted by the Russian Federation entitled "Achievement of a uniform interpretation of the right of self-defence in conformity with the Charter of the United Nations as applied to outer space as a factor in maintaining outer space as a safe and conflict-free environment and promoting the long-term sustainability of outer space activities" (A/AC.105/L.294), which had previously been made available to the Subcommittee at its fifty-second session;

(e) Working paper submitted by the Russian Federation entitled "Considerations regarding the modalities for consolidating the understanding on

issues of enhancing the practice in the registration of space objects in view of the need to ensure the safety of space operations" (A/AC.105/L.295), which had previously been made available to the Subcommittee at its fifty-second session;

(f) Working paper submitted by the Russian Federation entitled "Additional considerations and proposals for building up understanding of the priority aspects, comprehensive meaning and functions of the concept and practices of ensuring the long-term sustainability of outer space activities" (A/AC.105/L.296), which had previously been made available to the Subcommittee at its fifty-second session;

(g) Conference room paper submitted by the Russian Federation entitled "Time for the international community to decide whether it would support an effective set of solutions regarding the enhancement of the safety of space operations or wind up its work on this topic with inconclusive results devoid of any functional load and having marginal practical usefulness" (A/AC.105/2015/CRP.15);

(h) Conference room paper submitted by the United States entitled "Proposal by the United States for an expert group on collaborative space situational awareness" (A/AC.105/2015/CRP.17);

(i) Conference room paper submitted by the United States entitled "Views of the United States on draft guidelines for the long-term sustainability of outer space activities" (A/AC.105/2015/CRP.18);

(j) Conference room paper submitted by the Russian Federation entitled "Russian assessment of the initiative and actions of the European Union to advance its draft code of conduct in space" (A/AC.105/2015/CRP.19);

(k) Conference room paper submitted by the delegations of Brazil, China, India, the Russian Federation and South Africa (the BRICS States) entitled "Joint Statement of the delegations of the BRICS States at the fifty-eighth session of the Committee on the Peaceful Uses of Outer Space on issues pertaining to the elaboration of the guidelines on long-term sustainability of outer space activities" (A/AC.105/2015/CRP.20).

100. The Committee noted that the Working Group had met during the current session of the Committee, using available interpretation services, and that the Chair of the Working Group had held informal consultations with interested delegations during the current session. During those consultations, negotiations had been held on the updated set of draft guidelines (A/AC.105/L.298).

101. The Committee underscored the importance of the work of the Working Group and the progress it had made, and commended the Chair for his tireless efforts.

102. The Committee noted with appreciation that the updated set of draft guidelines, as contained in document A/AC.105/L.298, had been based on the reports of the four expert groups and included additional guidelines and amendments introduced by member States. The Committee noted that the update provided a good basis for further discussion and for the finalization of the guidelines.

103. The Committee noted that several recommendations contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (see A/68/189) related directly to the work of

the Working Group, which additionally highlighted the importance of timely completion of the guidelines.

104. The Committee also noted that the guidelines, once finalized, would contribute to the enhancement of transparency, to confidence-building and to the safety and sustainability of outer space activities, and would form part of a broader framework aimed at fostering the sustainable use of outer space.

105. Some delegations expressed the view that, although the updated set of guidelines provided a sound basis for their finalization, their overall coherence and consistency still needed further improvement. Suggestions included restructuring them into four chapters to improve clarity and overall balance; formulating their provisions consistently; clarifying their interrelationship with the existing legal framework; further consolidating, streamlining and shortening them; and ensuring that they contained action-oriented language.

106. Some delegations expressed the view that the Subcommittee should be able to complete the assigned task of elaborating the set of guidelines, as the guidelines would in the long term prove to be instrumental in furthering the interests of States and the international community in preserving outer space as an operationally safe, stable and conflict-free environment. Those delegations called upon member States to maintain a constructive and cooperative approach, with a view to ensuring that consolidation of the draft guidelines continued apace, as agreed by consensus.

107. Some delegations expressed the view that timely finalization of the guidelines was of paramount importance, in view of the proliferation of space debris and the increased risk of collisions of space objects, which posed a serious threat to the safety of space operations and the long-term sustainability of outer space activities.

108. The view was expressed that in finalizing the draft guidelines, the following principles should be preserved: long-term sustainability must be understood as a necessary prerequisite for the conduct of space activities in order to prevent any action that could affect, harm, damage or destroy space objects placed in orbit or on their way to orbit; outer space should be prevented from becoming an area of conflict among countries or with any private or public organization; placement of weapons or any hostile action in outer space should clearly be recognized as incompatible with the sustainable use of outer space; the adoption of space debris mitigation and removal measures must take into account the historical responsibilities of spacefaring nations and emerging spacefaring nations should not, under any condition, be obliged to bear the burden or share the costs of space debris removal.

109. Some delegations expressed the view that the guidelines should not include any provisions that might limit or hamper access to space for nations with emerging space capabilities.

110. Some delegations expressed the view that the complexity of issues relating to the long-term sustainability of outer space activities, such as active space debris removal, required consideration from both a technical and a legal perspective. Those delegations called for greater involvement of the Legal Subcommittee.

111. Some delegations expressed the view that, once the guidelines were finalized, the Scientific and Technical Subcommittee was the appropriate forum for the exchange of information on their implementation.

112. The view was expressed that the draft guidelines should not use the term "space situational awareness", as it was interpreted differently by different space actors. That delegation was also of the view that it would be more appropriate to use concrete terms for information needed in concrete situations, such as "trajectory of motion", "potentially hazardous conjunction" and "physical properties of objects".

113. The view was expressed that only the availability of aggregate information on the situation in space, space objects and space events would allow for the creation and application of a comprehensive international mechanism for ensuring the long-term sustainability of outer space activities.

114. The Committee noted with appreciation that a regional workshop on the long-term sustainability of outer space activities had been held in San José, on 7 and 8 April 2015, organized by the Secure World Foundation in collaboration with the Central American Association for Aeronautics and Space and with the support of the Ministry of Foreign Affairs of Costa Rica, and that it had been a valuable platform to advance regional space sustainability discussions within Latin America.

11. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union

115. The Committee took note of the discussion of the Subcommittee under the item on the examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of ITU, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 260-270).

116. Some delegations expressed the view that the geostationary orbit was a limited natural resource that was at risk of becoming saturated, thereby threatening the sustainability of space activities in that environment; that its exploitation should be rationalized; and that it should be made available to all States, under equitable conditions, irrespective of their current technical capabilities, taking into particular account the needs of developing countries and the geographical position of certain countries. Those delegations were also of the view that it was important to use the geostationary orbit in compliance with international law, in accordance with the decisions of ITU and within the legal framework established in the relevant United Nations treaties.

117. Some delegations expressed the view that the geostationary orbit was part of outer space, that it was not subject to national appropriation by claim of sovereignty, by occupation or by any other means, including by means of use or repeated use, and that its utilization was governed by the Outer Space Treaty and ITU treaties.

118. Some delegations expressed the view that, in order to ensure the sustainability of the geostationary orbit, it was necessary to keep the issue on the agenda of the Subcommittee and to explore it further, through the creation of appropriate working groups and legal and technical intergovernmental panels, as necessary.

12. Draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee

119. The Committee took note of the discussion of the Subcommittee under the item on the draft provisional agenda for the fifty-third session of the Scientific and Technical Subcommittee, as reflected in the report of the Subcommittee (A/AC.105/1088, paras. 271-282).

120. The Committee endorsed the recommendations and decisions on the item made by the Subcommittee (A/AC.105/1088, paras. 273-278).

121. On the basis of the deliberations of the Subcommittee at its fifty-second session, the Committee agreed that the following items should be considered by the Subcommittee at its fifty-third session:

1. General exchange of views and introduction of reports submitted on national activities.
2. United Nations Programme on Space Applications.
3. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.
4. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
5. Space debris.
6. Space-system-based disaster management support.
7. Recent developments in global navigation satellite systems.
8. Space weather.
9. Near-Earth objects.
10. Use of nuclear power sources in outer space.

    (Work for 2016 as reflected in the extended multi-year workplan of the Working Group (see A/AC.105/1065, para. 187 and annex II, para. 9))

11. Long-term sustainability of outer space activities.

    (Work for 2016 as reflected in the multi-year workplan of the Working Group (A/64/20), para. 161) and extended by the Committee at its fifty-seventh session (A/69/20, para. 199))

12. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.

    (Single issue/item for discussion)

13. Draft provisional agenda for the fifty-fourth session of the Scientific and Technical Subcommittee, including identification of subjects to be dealt with as single issues/items for discussion or under multi-year workplans.

122. The Committee agreed that the Working Group of the Whole, the Working Group on the Use of Nuclear Power Sources in Outer Space and the Working Group on the Long-term Sustainability of Outer Space Activities should be reconvened at the fifty-third session of the Scientific and Technical Subcommittee.

123. The Committee agreed that the topic for the symposium to be organized in 2016 by the Office for Outer Space Affairs, in accordance with the agreement reached by the Subcommittee at its forty-fourth session, in 2007 (A/AC.105/890, annex I, para. 24), should be "The role of industry in space exploration".

124. The Committee endorsed the agreement reached by the Asia-Pacific States that Chiaki Mukai (Japan) would serve as Chair of the Working Group of the Whole in 2016 while V. K. Dadhwal (India) held the position of Chair of the Subcommittee, and that in 2017, V. K. Dadhwal would continue his chairmanship of the Working Group of the Whole.

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Draft report

Addendum

Chapter II

Recommendations and decisions

C. Report of the Legal Subcommittee on its fifty-fourth session

1. The Committee took note with appreciation of the report of the Legal Subcommittee on its fifty-fourth session (A/AC.105/1090), which contained the results of its deliberations on the items considered by the Subcommittee in accordance with General Assembly resolution 69/85.

2. The Committee expressed its appreciation to Kai-Uwe Schrogl (Germany) for his able leadership during the fifty-fourth session of the Subcommittee.

3. The representatives representatives of Austria, Brazil, Canada, China, Colombia, the Czech Republic, Germany, Japan, Pakistan, Republic of Korea, Russian Federation, South Africa, United States and Venezuela (Bolivarian Republic of) made statements under the item. Statements were also made under the item by the representative of Chile on behalf of the Group of 77 and China and on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by other member States.

4. Some delegations reiterated the need to strengthen interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to synchronize the progressive development of space law with key scientific and technical developments in that area. They also expressed the view that the results attained by the working groups established under the Scientific and Technical Subcommittee should be submitted officially to the Legal Subcommittee for analysis.

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1. Information on the activities of international intergovernmental and non-governmental organizations relating to space law

5. The Committee took note of the discussion of the Subcommittee under the item on information on the activities of international intergovernmental and non-governmental organizations relating to space law, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 35-49).

6. The Committee noted the important role of international intergovernmental and non-governmental organizations and their contribution to its endeavours to promote the development of space law, and endorsed the recommendation of the Subcommittee that such organizations should again be invited to report to the Subcommittee at its fifty-fifth session on their activities relating to space law.

7. The Committee also noted that, in accordance with the decision of the Subcommittee, the International Institute for the Unification of Private Law (Unidroit) had made available to the Subcommittee information on recent developments in relation to the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets (A/AC.105/1090, para. 47).

2. Status and application of the five United Nations treaties on outer space

8. The Committee took note of the discussion of the Subcommittee under the item on the status and application of the five United Nations treaties on outer space, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 50-74).

9. The Committee endorsed the decisions and recommendations of the Subcommittee and its Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, which had been reconvened under the chairmanship of Jean-François Mayence (Belgium) (A/AC.105/1090, para. 53, and annex I, paras. 13, 15 and 16).

10. Some delegations expressed the view that the United Nations treaties on outer space formed an indispensable legal basis for supporting the increasing scale of space activities and for strengthening international cooperation on the peaceful uses of outer space. Those delegations welcomed the growing adherence to the treaties and encouraged those States that had not yet become parties to the treaties to consider doing so.

11. Some delegations expressed the view that the Committee should review, update and modify the five treaties for the purpose of strengthening the guiding principles of outer space activities, in particular those principles protecting its peaceful use, establish the responsibility of States in space activities carried out by both governmental and non-governmental entities and encourage international cooperation.

12. The view was expressed that a universal, comprehensive convention on outer space should be developed with the aim of finding solutions for existing issues, which would allow the international legal regime on outer space to be taken to the next level of its development.

13. The view was expressed that an approach oriented towards a universal, comprehensive convention on outer space would be counterproductive, as the

principles contained in the existing space law instruments had established a framework that had encouraged the use and exploration of outer space for both spacefaring and non-spacefaring nations.

14. Some delegations expressed the view that, given the rapid increase in space activities and the emergence of new space actors, more coordination and synergy between the Legal Subcommittee and the Scientific and Technical Subcommittee were needed in order to promote the understanding, acceptance and application of the existing United Nations treaties and to strengthen the responsibility of States in carrying out space activities.

3. Matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union

15. The Committee took note of the discussion of the Subcommittee under the agenda item on matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of ITU, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 75-98).

16. The Committee endorsed the recommendations of the Subcommittee and its Working Group on the Definition and Delimitation of Outer Space, reconvened under the chairmanship of José Monserrat Filho (Brazil) (A/AC.105/1090, para. 78, and annex II, para. 17).

17. Some delegations welcomed the initiative of the Chair of the Working Group to define the term "space activities", which was one of the areas yet to be regulated by space law, with the objective of building a consensus, even a preliminary one, while temporarily putting aside the task of defining and delimiting outer space.

18. The Committee noted with satisfaction that a joint aerospace symposium on the theme "Emerging space activities and civil aviation: challenges and opportunities" had been organized by ICAO and the Office for Outer Space Affairs and held in Montreal, Canada, from 18 to 20 March 2015. The Committee noted that follow-up symposiums would be held in the United Arab Emirates in 2016 and in Vienna in 2017. The Committee also noted that the Office for Outer Space Affairs and ICAO would lead the learning group set up as a forum for discussion and that States members of the Committee would be invited to nominate their experts for membership in the learning group.

19. Some delegations expressed the view that scientific and technological progress, the commercialization of outer space, the participation of the private sector, emerging legal questions and the increasing use of outer space in general had made it necessary for the Subcommittee to consider the question of the definition and delimitation of outer space. The delegations expressing that view were also of the view that the definition and delimitation of outer space would help to establish a single legal regime regulating the movement of an aerospace object and to bring about legal clarity in the implementation of space law and air law, as well as to clarify the issues of the sovereignty and international responsibility of States and the boundary between airspace and outer space.

20. Some delegations expressed the view that the geostationary orbit — a limited natural resource clearly in danger of saturation — needed to be used rationally and should be made available to all States, irrespective of their current technical capacities. That would give States the possibility of access to the geostationary orbit under equitable conditions, bearing in mind, in particular, the needs and interests of developing countries, as well as the geographical position of certain countries, and taking into account the processes of ITU and relevant norms and decisions of the United Nations.

21. Some delegations expressed the view that the geostationary orbit was a limited natural resource with great potential for the implementation of a wide array of programmes for the benefit of all States and that it was at risk of becoming saturated, thereby threatening the sustainability of space activities in that environment; that its exploitation should be rationalized; and that it should be made available to all States, under equitable conditions, taking into particular account the needs of developing countries. Those delegations were also of the view that it was important to use the geostationary orbit in compliance with international law, in accordance with the decisions of ITU and within the legal framework established in the relevant United Nations treaties, while giving consideration to the contributions of space activities to sustainable development and the achievement of the Millennium Development Goals.

22. Some delegations expressed the view that the geostationary orbit was part of outer space, that it was not subject to national appropriation by a claim of sovereignty, by occupation or by any other means, including by means of use or repeated use, and that its utilization was governed by the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the ITU Constitution, Convention and Radio Regulations.

23. Some delegations expressed the view that, in order to ensure the sustainability of the geostationary orbit, it was necessary to keep that issue on the agenda of the Subcommittee and to explore it further, through the creation of appropriate working groups and legal and technical intergovernmental panels, as necessary. Those delegations were of the view that working groups or intergovernmental panels with technical and legal expertise should be established to promote equal access to the geostationary orbit, and called for the greater participation of ITU in the work of the Subcommittee on those matters.

4. National legislation relevant to the peaceful exploration and use of outer space

24. The Committee took note of the discussion of the Legal Subcommittee under the item on national legislation relevant to the peaceful exploration and use of outer space as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 99-110).

25. The Committee noted with satisfaction that some States members of the Committee had already begun to implement the recommendations on national legislation relevant to the peaceful exploration and use of outer space contained in General Assembly resolution 68/74.

26. The Committee commended the Office for Outer Space Affairs and ITU for preparing a handout on issues related to registration, authorization, debris mitigation

and frequency management with respect to small and very small satellites that would become an important source of information for space actors intending to operate such satellites.

27. The Committee noted various activities of member States in strengthening or developing their national space laws and policies, as well as in reforming or establishing the governance of national space activities. In that connection, the Committee also noted that those activities were aimed at improving management, increasing competitiveness, involving academia, better responding to challenges posed by the development of space activities and better implementing international obligations.

28. The Committee noted with satisfaction the increasing number of space-related international cooperation programmes and projects, and stressed the importance of the development of space legislation by States, as national regulatory frameworks played a significant role in regulating and promoting such cooperation activities.

29. The view was expressed that it was important to take into account the increased level of commercial and private activities in outer space when developing a national space-related regulatory framework, particularly with respect to the responsibilities of States regarding their national space activities.

30. The Committee agreed that the general exchange of information on national legislation relevant to the peaceful exploration and use of outer space provided States with a comprehensive overview of the current status of national space laws and regulations and assisted States in understanding the different approaches taken at the national level with regard to the development of national space-related regulatory frameworks.

5. Capacity-building in space law

31. The Committee took note of the discussion of the Subcommittee under the item on capacity-building in space law, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 111-134).

32. The Committee endorsed the recommendation of the Subcommittee on the agenda item (A/AC.105/1090, para. 134).

33. The Committee agreed that international cooperation in research, training and education in space law was essential in order to further develop space activities and increase knowledge of the legal framework within which space activities were carried out.

34. The Committee noted that more efforts were needed to increase awareness of space law and its importance to space activities and programmes. Endeavours in that area such as the holding of workshops and the development of a curriculum played a vital role in building relevant capacity.

35. The Committee reaffirmed that the regional centres for space science and technology education, affiliated to the United Nations, had an important role in providing teaching and training opportunities in space law. The Committee noted that greater use of the regional centres could be made in order to provide more opportunities for academic linkages.

36. The Committee noted with appreciation the holding of the ninth United Nations workshop on space law, on the theme "The role of national space legislation in strengthening the rule of law". The workshop, held in Beijing from 17 to 21 November 2014, had been hosted by the Government of China and organized jointly by the Office for Outer Space Affairs, APSCO and the China National Space Administration.

37. The Committee noted with appreciation that the next APSCO Space Law and Policy Forum would be held in Beijing from 21 to 23 September 2015 and would be co-hosted by APSCO and the Institute of Space Law of the Beijing Institute of Technology. The Forum would focus on regional space cooperation and the latest developments in space law and policy.

38. The Committee reaffirmed its satisfaction at the completion of the education curriculum on space law and the updated web-based compilation of reading materials, found on the website of the Office for Outer Space Affairs, and welcomed the recent translation of the curriculum into all official United Nations languages.

6. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space

39. The Committee took note of the discussion of the Subcommittee under the item on the review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 135-153).

40. Some delegations expressed the view that it was exclusively States, irrespective of their level of social, economic, scientific or technical development, that had an obligation to engage in regulatory activity associated with the use of nuclear power sources in outer space and to adapt national legislation to relevant international standards. Those delegations were also of the view that Governments bore international responsibility for national activities involving the use of nuclear power sources in outer space conducted by governmental and non-governmental organizations and that such activities must be beneficial, not detrimental, to humanity.

41. Some delegations called on the Legal Subcommittee to undertake a review of the Safety Framework for Nuclear Power Source Applications in Outer Space and to promote binding standards, with a view to ensuring responsible use of those sources.

42. Some delegations expressed the view that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to promote greater understanding, acceptance and implementation of the legal instruments and the development of new legal instruments related to the use of nuclear power sources in outer space.

43. Some delegations expressed the view that more consideration should be given to the use of nuclear power sources in outer space, specifically in the geostationary orbit and low-Earth atmosphere, in order to address the legal aspects of the problem of potential collisions of nuclear-powered space objects in orbit and the incidents or emergencies that could be created by the accidental re-entry of such objects into the

Earth's atmosphere, as well as the impact of such a re-entry on the Earth's surface, human life and health and the ecosystem.

7. General exchange of information and views on legal mechanisms relating to space debris mitigation measures, taking into account the work of the Scientific and Technical Subcommittee

44. The Committee took note of the discussion of the Legal Subcommittee under the item on the general exchange of information and views on legal mechanisms relating to space debris mitigation measures, taking into account the work of the Scientific and Technical Subcommittee, as reflected in the report of the Legal Subcommittee (A/AC.105/1090, paras. 154-184).

45. The Committee endorsed the decisions of the Subcommittee as contained in its report (A/AC.105/1090, para. 184).

46. The Committee noted the increasing amount of space debris and noted with satisfaction that the endorsement by the General Assembly, in its resolution 62/217, of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space[1] was a key step in providing all spacefaring nations with guidance on how to mitigate the problem of space debris, and encouraged Member States to consider voluntary implementation of the Guidelines.

47. The Committee noted with satisfaction that some States had taken measures to enforce the implementation of internationally recognized guidelines and standards relating to space debris through relevant provisions in their national legislation.

48. The Committee expressed its appreciation to Canada, the Czech Republic and Germany for the development of the compendium of space debris mitigation standards adopted by States and international organizations, and to the Secretariat for maintaining the compendium on a dedicated page of the website of the Office for Outer Space Affairs.

49. The Committee agreed that States members of the Committee and international intergovernmental organizations having permanent observer status with the Committee should be invited to further contribute to the compendium of space debris mitigation standards adopted by States and international organizations by providing or updating the information on any legislation or standards adopted with regard to space debris mitigation, using the template provided for that purpose. The Committee also agreed that all other States Members of the United Nations should be invited to contribute to the compendium and encouraged States with such regulations or standards to provide information on them.

50. Some delegations expressed the view that it was of the utmost importance to continue treating the legal aspects of issues related to space debris as a priority by discussing legal matters related to the generation of space debris and regulating its mitigation and removal. Those delegations were of the view that mitigation measures should not lead to the adoption of overly high standards or thresholds that would impede the development of the capacities of developing countries.

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[1] *Official Records of the General Assembly, Sixty-second Session, Supplement No. 20* (A/62/20), paras. 117 and 118 and annex.

51. Some delegations expressed the view that it was necessary to strengthen the interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to synchronize the progressive development of space law with major progress in space science and technology, and that outcomes of the work of working groups of the Subcommittee, in particular the Space Debris Mitigation Guidelines of the Committee, should be officially presented to the Legal Subcommittee for legal analysis regarding compliance with principles on outer space.

8. General exchange of information on non-legally binding United Nations instruments on outer space

52. The Committee took note of the discussion of the Subcommittee under the item entitled "General exchange of information on non-legally binding United Nations instruments on outer space", as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 185-203) and endorsed the decisions of the Subcommittee as contained in its report (A/AC.105/1090, para. 203) on the retention of the item on the agenda of the Subcommittee at its fifty-fifth session, in 2016.

53. The Committee noted that existing non-legally binding United Nations instruments related to space activities had played an important role in complementing and supporting the United Nations treaties on outer space and served as an important means to address emerging challenges, such as the safe and sustainable use of outer space.

54. The Committee welcomed the efforts by the delegation of Japan to promote the exchange of views under the agenda item of the Subcommittee further by simplifying the questionnaire contained in A/AC.105/C.2/2015/CRP.24/Rev.1, and encouraging States members of the Committee and international organizations having permanent observer status with the Committee to respond, on a voluntary basis and as appropriate, to that questionnaire, and to submit their proposals to the delegation. The delegation of Japan had been invited to prepare a compilation of responses to be submitted to the Subcommittee during its fifty-fifth session, in 2016 (A/AC.105/1090, para. 191).

55. Some delegations expressed the view that there remained a significant divergence of opinion regarding the scope of deliberations under the agenda item of the Subcommittee. Those delegations also welcomed the agreement by the Subcommittee to retain the item on the agenda of the Subcommittee at its fifty-fifth session to continue the debate on both its substance and scope.

56. Some delegations expressed the view that the discussion under the agenda item should not be confined to examining solely the non-legally binding United Nations instruments, but all non-legally binding instruments related to space activities, which included existing ones as well as those under development. That included discussions on the European Union-led initiative on a draft international code of conduct for outer space activities, which should be conducted in a transparent way within the United Nations, in particular in the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space.

57. Some delegations were of the view that the Subcommittee should go beyond the discussion of non-legally binding instruments and aim at developing new legally

binding rules pertaining to outer space activities in order to reduce the legal uncertainties faced by both spacefaring and emerging spacefaring nations.

9. Review of international mechanisms for cooperation in the peaceful exploration and use of outer space

58. The Committee took note of the discussion of the Legal Subcommittee under the item on the review of international mechanisms for cooperation in the peaceful exploration and use of outer space, in accordance with its five-year workplan, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 204-216).

59. The Committee endorsed the decisions and recommendations of the Subcommittee and its Working Group on the Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space, which had been reconvened by the Subcommittee at its fifty-fourth session, under the chairmanship of Setsuko Aoki (Japan) (A/AC.105/1090, para. 206, and annex III, paras. 9-10).

60. The Committee noted the breadth and diversity of the mechanisms utilized in space cooperation, including multilateral and bilateral legally binding agreements; memorandums of understanding; non-legally binding arrangements; principles and technical guidelines; multilateral coordination mechanisms through which space-system operators coordinated the development of applications of space systems for the benefit of the environment, human security and welfare, and development; and mechanisms facilitating a variety of international and regional organizations and forums.

61. The Committee also noted that the review of mechanisms for cooperation in space activities would allow for a clear overview to be gained of the different forms of international cooperation in space activities being undertaken and for analysis of their success. The Committee further noted that the review would contribute to the strengthening of international cooperation in the exploration and peaceful uses of outer space.

62. The Committee noted with satisfaction that the exchange of information under the item demonstrated the broad range of international cooperative mechanisms employed by States members of the Committee and that common principles and procedures had emerged through that exchange, as member States examined the various potential mechanisms to facilitate future cooperation in the exploration and peaceful uses of outer space.

10. Draft provisional agenda for the fifty-fifth session of the Legal Subcommittee

63. The Committee took note of the discussion of the Subcommittee under the item on proposals to the Committee for new items to be considered by the Legal Subcommittee at its fifty-fifth session, as reflected in the report of the Subcommittee (A/AC.105/1090, paras. 220-225).

64. On the basis of the deliberations of the Legal Subcommittee at its fifty-fourth session, the Committee agreed that the following substantive items should be considered by the Subcommittee at its fifty-fifth session:

Regular items

1. Adoption of the agenda.
2. Election of the Chair.
3. Statement by the Chair.
4. General exchange of views.
5. Information on the activities of international intergovernmental and non-governmental organizations relating to space law.
6. Status and application of the five United Nations treaties on outer space.
7. Matters relating to:
   (a) The definition and delimitation of outer space;
   (b) The character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union.
8. National legislation relevant to the peaceful exploration and use of outer space.
9. Capacity-building in space law.

Single issues/items for discussion

10. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.
11. General exchange of information and views on legal mechanisms relating to space debris mitigation measures, taking into account the work of the Scientific and Technical Subcommittee.
12. General exchange of information on non-legally binding United Nations instruments on outer space.
13. General exchange of views on the legal aspects of space traffic management.
14. General exchange of views on the application of international law to small satellite activities.

Items considered under workplans

15. Review of international mechanisms for cooperation in the peaceful exploration and use of outer space.

    (Work for 2016 as reflected in the multi-year workplan in the report of the Legal Subcommittee on its fifty-first session (A/AC.105/1003, para. 179))

New items

16. Proposals to the Committee on the Peaceful Uses of Outer Space for new items to be considered by the Legal Subcommittee at its fifty-sixth session.

65. The Committee agreed that the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, the Working Group on the Definition and Delimitation of Outer Space and the Working Group on the Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space should be reconvened at the fifty-fifth session of the Legal Subcommittee.

66. The Committee also agreed that the Subcommittee should review, at its fifty-fifth session, the need to extend beyond that session the mandate of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space.

67. The Committee commended Jean-François Mayence (Belgium), the outgoing Chair of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, for his dedication in chairing the Working Group and his tireless efforts in moving the discussions in the Working Group forward.

68. The Committee endorsed the agreement reached by the Western European and other States that Bernhard Schmidt-Tedd (Germany) would serve as Chair of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space.

69. The Committee agreed that IISL and the European Centre for Space Law should be invited to organize a symposium on space law at the fifty-fifth session of the Subcommittee.